THE IRON AGE

THURSDAY, OCTOBER 9, 1902.

Test of Steam Turbine at Hartford.

For some time there has been running at the Hartford Electric Light Company's power plant at Hartford, Conn., the largest steam turbine yet installed in this country. It was built by the Westinghouse Machine Company and has fully demonstrated its ability to sustain a load much in excess of its rated captacity, which is 1500 kw.

As we have already described the design of this particular type of turbine, it is only necessary at the present time to mention the leading features of the Hartford machine. In this installation the piping is such that steam may be taken from either the regular or the superheated main. Steam at 150 pounds pressure passes through the 9-inch main to the throttle valve near the center of the turbine, Fig. 1. It then goes to the receiver, at the right, which contains the admission valves, which are controlled by the governor, which is placed above the platform at the extreme right. The action is such that steam is admitted 152 times per minute, no matter what the load may be. The governor controls the time during which steam is admitted.

The steam is delivered upon the curved vanes of the turbine, which are arranged in four series or groups, in which the areas and passages increase to accommodate the expanding steam. The diameters of these sections are 24 inches at the smaller end and 86 inches at the larger. In all there are 31,000 blades, about 16,000 of which are rotating. They vary in length from 1¾ inches at the high pressure to 8 inches at the low. The exhaust outlet has an area 22.63 times that of the supply pipe.

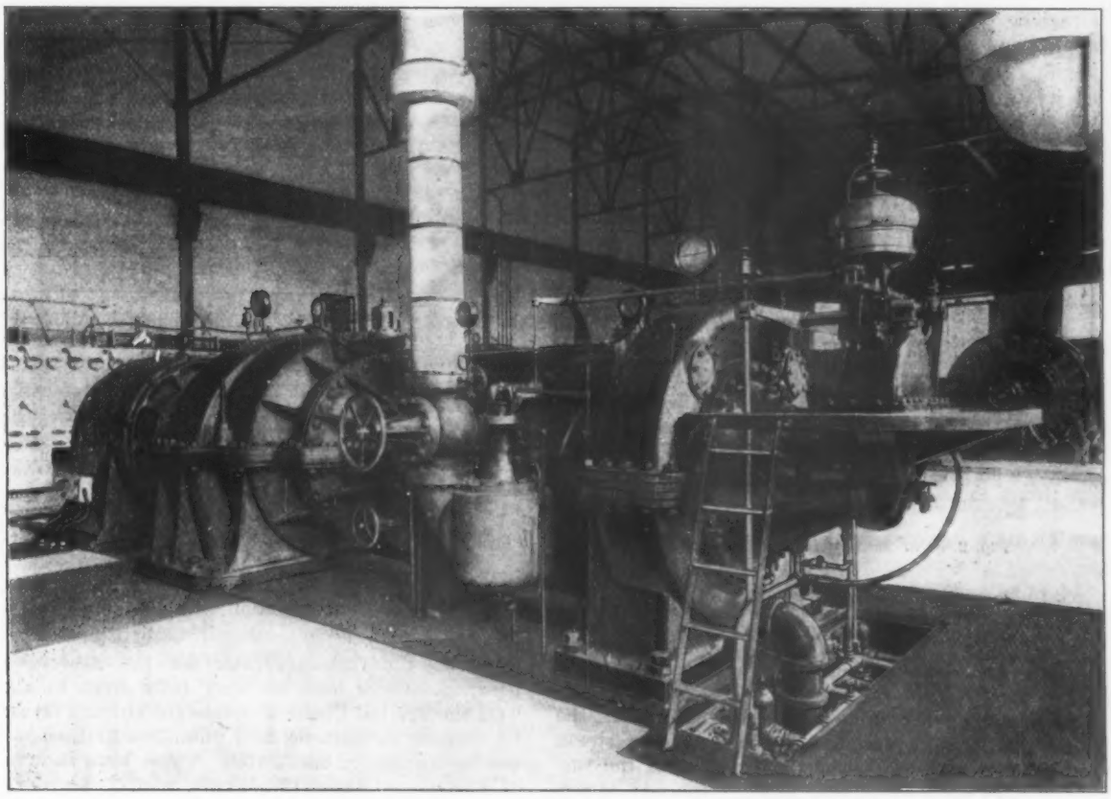
Test of Turbine.

The tests were made by Prof. Wm. Lispenard Robb, assisted by several students in the Electrical Laboratory of Trinity College. The following report is taken from the *Electrical World:*

The chief power of the Hartford Electric Light Company is water power, steam being used simply to supplement this in case of low water. In a year of normal rainfall the steam plant would be operated practically continuously for about three months, and during the peak of the load for about as many more months.

The steam turbine was installed on account of its lower first cost, small cost of installation, relatively small space occupied in the station, and its relatively high efficiency at fractional loads. The turbo-generator installed at Hartford has a rated capacity of 1500 kw. It has developed, however, that the capacity is considerably greater, and it would now be rated at 2000 kw.

The boiler plant consists of three Aultman-Taylor water tube boilers, each having a rated capacity of 550 horse-power. The condenser is of the barometer type, manufactured by the Worthington Company, and the water for condensing purposes is supplied from three cooling towers.



TEST OF STEAM TURBINE AT HARTFORD.

The output of the generator was measured by instruments carefully calibrated with standard Weston instruments. As the condenser was of the jet type the steam consumption had to be measured by weighing the input of water into the boilers. In order to obtain accurate results this, of course, necessitated continuing the tests through a considerable time, so as to eliminate any error due to inaccuracy in having the same quantity of water in boilers at the beginning and end of tests.

During the test one of the boilers was disconnected from the other two and used to operate the steam auxiliaries. The remaining two boilers were used for supplying steam to the turbine itself. One of the two latter boilers was equipped with a superheater, capable of superheating the steam from that boiler to about 60 de-

grees F. As the steam from this boiler was mixed with the steam from the second boiler it insured superheated steam at the turbine. The degree of superheat, however, fluctuated very widely, depending on the relative amount of steam supplied from each of the two boilers.

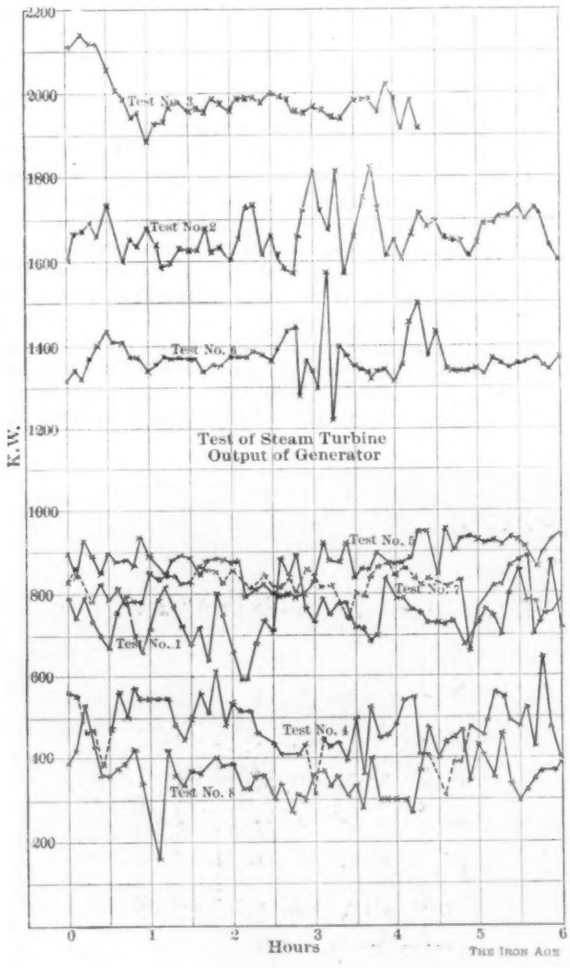


Fig. 2.—Curves Showing Variations in Load.

During the first test the boiler with superheater was cut out.

The accompanying table gives a summary of the readings and results obtained therefrom. The steam consumption represents the steam supplied to the turbine and does not include that used by the auxiliaries.

not offered, and it would in any case be very much more satisfactory to carry out a special series of tests in a plant equipped with a surface condenser.

The curves of Fig. 2 show the variation in load during the various tests.

I have embodied the results contained in the above table in the curve of Fig. 3, giving the steam consumption per kilowatt hour as a function of the load. In the case of the first test, where the steam was not superheated, I have reduced the results to what they would have been had the degree of superheat been the same as the mean in the other tests—that is, 32.9 degrees of superheat. In making this correction I have made use of the data obtained by W. H. Lindley and Schroeder and Weber in their

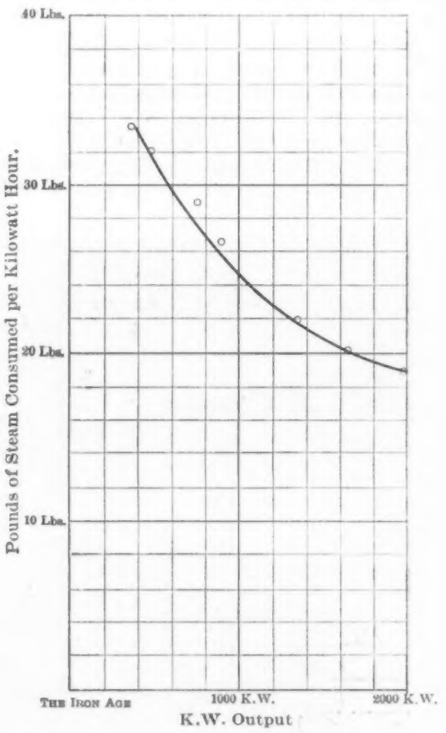


Fig. 3.—Curve Showing Steam Consumption Per Kilowatt Hour.

TEST OF STEAM TURBINE AT HARTFORD

tests of the turbo-generator for the Elberfeld Corporation. These tests are very fully given in a paper, "On the Trial of Steam Turbines for Driving Dynamos," by Charles A. Parsons, and published in London *Engineering* for September 6, 1901. These tests show a gain of efficiency of about 12 per cent. with 55 degrees C. su-

Test. No.	Date. 1902.	Load. Ave. Kw.	Load. Max. Kw.	Load. Min. Kw.	Length of test. Hours.	Steam gauge pressure. Mean. Lbs.	Steam gauge pressure. Max. Lbs.	Steam gauge pressure. Min. Lbs.	Barometer. Inch.	Inches vacuum at turbine. Mean. Inch.	Inches vacuum at turbine. Max. Inch.	Inches vacuum at turbine. Min. Inch.	Superheat degrees F. Mean.	Superheat degrees F. Max.	Superheat degrees F. Min.	Coal. E. H.-P. hour. Lbs.	Coal. Kilo-watt hour. Lbs.	Steam. E. H.-P. hour. Lbs.	Steam. Kilo-watt hour. Lbs.
1	Jan. 27	748	885	580	6	155.5	161.0	143.0	30.70	26.22	27.30	25.50	....	....	....	2.27	3.02	24.13	32.17
2	" 28	1,657	1,820	1,480	6	151.3	158.0	145.0	30.73	28.00	28.20	27.85	40.08	61.34	19.85	1.33	1.76	15.15	20.20
3	Feb. 1	1,998	2,185	1,900	4	155.4	158.0	146.0	30.27	26.91	27.30	26.75	41.56	55.05	32.45	1.28	1.70	14.43	19.10
4	May 7	471	730	310	6	151.8	155.0	147.0	29.86	26.62	26.90	26.20	19.10	29.00	3.50	2.20	2.93	23.97	31.96
5	" 8	888	980	750	6	152.6	156.0	149.0	30.04	25.83	26.70	25.50	32.90	47.50	12.00	1.85	2.46	19.90	26.53
6	" 9	1,371	1,570	1,110	6	151.9	156.0	140.0	29.81	26.26	26.90	25.50	32.10	38.60	12.50	1.52	2.03	16.46	21.94
7	" 12	834	940	660	6	153.2	157.0	149.0	30.26	27.26	27.40	27.00	35.40	45.10	20.10	1.76	2.35	18.50	24.60
8	" 13	364	520	150	6	153.1	156.0	149.0	30.06	27.40	27.60	27.10	29.00	41.00	2.50	2.49	3.32	25.10	33.47

An inspection of the table shows that, owing to the length of time required for the tests and the inability to vary the conditions without interfering with the station operation, all the tests, with the exception of the first one, were made under very closely similar conditions as regards vacuum and the amount of superheat in the steam. It would have been very interesting to have repeated these tests under varying conditions of superheat and vacuum, but as yet the opportunity has

perheat, and that every inch of vacuum improves the steam consumption about 4 per cent.

The prizes at the International Exhibition in Turin have been awarded. The American exhibitors are reported to be greatly disappointed. They consider that they were discriminated against and that they merited better awards.

The Suppression of Smoke in Steam Plants Using Bituminous Coal.*—II.

BY ALBERT A. CARY, NEW YORK.

Enough has been said to show the value of a knowledge of critical temperatures of combustion in reference to smoke suppression, fuel economy and furnace construction. The writer has used this information to great advantage in the development of furnaces. In such work I have made analyses of gases drawn from various positions above the fire, at the same time noting carefully the temperature of the gases at the time and place of withdrawal by means of a thermo-electric pyrometer. A few observations of this kind will inform one concerning the progress of combustion between the fire bed and the exit from the combustion chamber, and one will learn whether there is a too rapid falling off of temperature to produce the best results, and if so, the remedy can be applied at exactly the right point.

From the general statement made above concerning the temperatures necessary for perfect combustion one may form a fair idea of the degree of heat needed throughout the furnace and combustion chamber, and he can find approximately whether these temperature requirements are met in his own furnaces by using an inexpensive expedient known as Seger fusible cones. These pyrometer cones (as they are sometimes called) may be bought of most of the dealers in chemical and physical apparatus. They are made of earthen ware mixed with definite percentages of various substances, such as silicic acid, boric acid or phosphoric acid and alumina or some of the alkaline bases. They are molded into the form of long, slim pyramids and when placed in position are supported in an upright position on a dish like receptacle made of refractory material, which is suspended in the part of the furnace where the temperature is to be recorded. The cones are all numbered and the numbers are used in connection with a table of reference, which gives the temperature at which each numbered cone will fuse. It is usual to use two or three cones at a time, having different fusing points, so that when we find one cone fused or fallen and its neighbor still standing we know that the temperature must be somewhere between the two corresponding numbers stamped on these cones. There are about 60 in a full set (which is seldom required complete), ranging in temperatures of fusion from 1104 up to 3434 degrees F., and they average in cost between 3 and 4 cents apiece.

The melting points of metallic alloys have sometimes been used to determine temperatures, but they have often been found unreliable in furnace work, due to the corrosive or other chemical action set up between the metals and the furnace gases.

Referring again to the table of ignition temperatures we see that the ignition temperature for anthracite coal is considerably above that for bituminous coal, and we have seen further that although the temperature of the coal bed may be less for burning bituminous coal than is necessary for the combustion of anthracite, on the contrary, the temperature of the combustion chamber, where the distilled gases are burned, must be higher for bituminous coal, and that will account partially for the usefulness of fire arches and other equivalent arrangements used with this fuel, which assist materially in maintaining the high temperature of the combustible gases.

Combustion Under Varying Conditions.

Before taking a brief view of the methods in use for suppressing the smoke nuisance it will be interesting to consider the available heat produced by the complete and incomplete combustion of fuels and thereby we can form some idea of the sacrifices sometimes made by certain so-called "smoke consumers" in their attempt to suppress the smoke nuisance

The reader may note that this is the first mention I have made of smoke consumers. While I do not propose to deny that "smoke" (or rather the small flecks of carbon it contains) can be burned, I will state that if you are looking for economy with smokelessness you must secure a practically perfect combustion of the fuel in your furnace and its immediately connected combustion chamber, and not allow bad furnace conditions to exist and then attempt to "burn" the resulting smoke as it issues from the combustion chamber (or furnace). The fact that these troublesome flecks of carbon (or soot) are contained in an atmosphere of noncombustible gases (such as nitrogen and carbon dioxide) makes such a process of secondary combustion rather expensive.

In furnace practice we have seen that a properly regulated air supply is a most imperative factor in both smokeless combustion and economy. Air is a simple mechanical (not chemical) mixture of oxygen and nitrogen. The oxygen is the producer of combustion, while the nitrogen is an inert useless gas in the furnace, which tends to a certain degree to retard combustion by diluting the combustible gases. Nitrogen, nevertheless, has a certain amount of usefulness, as, if we were to supply pure oxygen to the furnace, the intense local temperature produced would melt the grate bars and the fire brick lining of our furnace and melt our ash to a most troublesome slag.

In every 100 pounds of air (aside from its small percentage of contained impurities) we will find practically 23 pounds of oxygen and 77 pounds of nitrogen. As these two gases have different weights per cubic foot we will find in 100 cubic feet of air about 21 cubic feet of oxygen and 79 cubic feet of nitrogen. The weight of air required for combustion is shown as follows:

To burn 1 pound of carbon to carbon dioxide (CO_2) there is required

2.667 pounds of oxygen, accompanied by
8.927 pounds of nitrogen, making a total of
11.594 pounds of air.

To burn 1 pound of carbon to carbon monoxide (CO) there is required

1.333 pounds of oxygen, accompanied by
4.464 pounds of nitrogen, making a total of
5.797 pounds of air.

To burn 1 pound of carbon monoxide (CO) to carbon dioxide (CO_2) there is required

0.571 pounds of oxygen, accompanied by
1.913 pounds of nitrogen, making a total of
2.484 pounds of air.

To burn 1 pound of hydrogen to water (H_2O) (*i. e.*, superheated steam) there is required

7.890 pounds of oxygen, accompanied by
27.414 pounds of nitrogen, making a total of
35.304 pounds of air.

To burn 1 pound of marsh gas (CH_4) to water and carbon dioxide there is required

3.998 pounds of oxygen, accompanied by
13.482 pounds of nitrogen, making a total of
17.480 pounds of air.

To burn 1 pound of olefiant gas (C_2H_4) (a hydrocarbon gas found in coal) to water and carbon dioxide there is required

3.427 pounds of oxygen, accompanied by
11.473 pounds of nitrogen, making a total of
14.900 pounds of air.

To burn 1 pound of water gas (CO + 2H) to carbon dioxide and to water there is required

1.066 pounds of oxygen, accompanied by
3.571 pounds of nitrogen, making a total of
4.637 pounds of air.

The reader, of course, understands that the quantity of air required for complete combustion, as expressed by the above figures, is the actual theoretical amount under perfect conditions, but as perfection does not exist in the boiler furnace a considerable excess of air must be supplied to obtain the practical required results, and this excess may be as high as from 50 to 100 per cent. and even more, according to conditions. An English authority states that as the rate of combustion and furnace temperature increases the proportion of excess air required decreases.

As we deal with volumes of air in furnace practice rather than weights, it becomes interesting to know how many cubic feet is required per pound of air.

The volume of air per pound varies with the pressure it is under and also with its temperature. At the sea level, where the barometer stands practically at 30

inches, the air is under a pressure of 14.7 pounds per square inch, and with a temperature of 62 degrees F. there is 13.14 cubic feet of air to the pound. If this air be placed under double this pressure (*i. e.*, 14.7 × 2 = 29.4 pounds per square inch) 1 pound will occupy one-half the volume—viz., 6.57 cubic feet. That is, the volume occupied per pound of air varies inversely as the pressure.

If P equals the pressure of the atmosphere at the sea level, and

p equals the atmospheric pressure at any other place, and

13.14 equals the number of cubic feet occupied by 1 pound of air at the sea level at 62 degrees F., and

V equals the number of cubic feet occupied by 1 pound of air at the place where the pressure p exists, at 62 degrees F., we have the simple formula,

$$V = 13.14 \frac{P}{p}$$

or, by substituting for these letters the values given to the above example, we have

$$V = 13.14 \times \frac{14.7}{29.4} \text{ or}$$

$$V = 6.57 \text{ cubic feet.}$$

The chief value of the information derived in this way is for making provisions for an air supply to a furnace located at high altitudes.

The pressure of the atmosphere at different altitudes is indicated by readings of the barometer and for convenient reference I give the following table:

Altitude above sea level in feet.	Approximate barometer reading, in inches.	Approximate atmospheric pressure per square inch.	Approximate volume occupied by 1 pound of air at 62 degrees F.	Approximate boiling point of water, in degrees F.
0	30.00	14.7	13.14	212.0
500	29.43	14.4	13.68	211.0
1,000	28.88	14.2	13.87	210.0
1,500	28.33	13.9	14.17	209.1
2,000	27.80	13.6	14.48	208.1
2,500	27.27	13.4	14.70	207.2
3,000	26.76	13.1	14.84	206.2
3,500	26.25	12.9	15.27	205.2
4,000	25.76	12.6	15.63	204.3
4,500	25.27	12.4	15.89	203.4
5,000	24.79	12.2	16.15	202.4
5,500	24.32	11.9	16.55	201.5
6,000	23.86	11.7	16.84	200.5
6,500	23.41	11.5	17.13	199.6
7,000	22.97	11.3	17.43	198.7
7,500	22.54	11.1	17.75	197.8
8,000	22.11	10.9	18.07	196.9
8,500	21.73	10.7	18.41	196.0
9,000	21.29	10.4	18.94	195.1
9,500	20.88	10.2	19.31	194.1
10,000	20.49	10.1	19.50	193.2
10,500	20.10	9.9	19.90	192.3
11,000	19.72	9.7	20.31	191.5
11,500	19.35	9.5	20.73	190.6
12,000	18.98	9.3	21.18	189.7
12,500	18.62	9.1	21.65	188.8
13,000	18.27	9.0	21.89	187.9
13,500	17.93	8.8	22.38	187.0

You will note that between an altitude of 10,000 and 10,500 feet 1 pound of air occupies 50 per cent. more space than it does at the sea level. Therefore, to burn the same amount of fuel at that altitude with air passing through the grate at the same velocity as in a plant at sea level, theoretically a 50 per cent. larger grate area will be required, or, if the grate area is not extended, 50 per cent. greater velocity must be given to the air in its passage through the fire bed.

This rarefaction of the air at high altitudes also makes it necessary to install larger fans than would be required at sea level, in case forced or induced draft is used, and chimneys should have somewhat greater area.

The State of Wyoming is reported to have an average altitude of 7200 feet above sea level, and 1 pound of air in that State must occupy approximately a volume of 17.61 cubic feet, which is approximately one-third greater space than occupied by the same weight of air at sea level.

Thus far we have been considering our air at a standard average temperature of 62 degrees F., but as soon as this temperature is changed we find the volume occupied by each pound of our air also altered. Experiment shows that the amount by which gas expands, when its temperature is increased by 1 degree F.—the pressure being kept constant—is about $^1/_{493}$ of its volume at 32 degrees F. Thus if we take 493 cubic inches of air at a temperature of 32 degrees F. and heat it to 33 degrees its volume alters to 494 cubic inches. If we heat it to 34 degrees its volume alters to 495, and so it will continue to increase; the heat adding 1 cubic inch for each additional degree increase in temperature, so that by the time the air reached 62 degrees F., which is 30 degrees above 32 degrees, we would find it increased to 493 + 30 = 523 cubic inches. We have seen that the space occupied by 1 pound of air at the sea level at 62 degrees temperature is 13.14 cubic feet. From what we have just considered we will see that the volume of this air at 32 degrees would be $^{493}/_{523}$ of 13.14 = 12.39 cubic feet.

Another method of expressing this law of change of volume in gases, due to change of temperature, is to say that the volume changes directly in proportion to its absolute temperature when the pressure is constant, as is practically the case in our considerations.

As air expands $^1/_{493}$ of its volume at 32 degrees F. for each degree increase of temperature, conversely, it diminishes in volume $^1/_{493}$ of its volume at 32 degrees F. for each degree decrease in temperature.

According to this theory, should we cool our air 493 degrees below 32 degrees F. (or 493 — 32 = 461 degrees below the zero point on the Fahrenheit thermometer), could the air still remain in its gaseous state it would have no volume at all.

Of course, any gas would change its physical state (from gas to liquid and from liquid to solid) before any such low temperature as 461 degrees F. below zero was reached; but, nevertheless, physicists have decided that this 461 degrees below zero (F.) is the true zero of all temperature readings and, therefore, after adding 461 to the number of degrees read on the Fahrenheit thermometer they call the result the "absolute" temperature of the body.

Now, as the volume of our air varies directly as our absolute temperature, we have merely to divide the absolute temperature, as found in practice, by the absolute temperature of the air at a certain degree at which we know the volume occupied by 1 pound (which is in this case 62 degrees + 461 degrees = 523 degrees) and then multiply the result by the known volume occupied by 1 pound of air, and the result will be the space occupied by the air at the desired temperature.

Thus, if we wish to find the space occupied by 1 pound of air at the sea level at 10 degrees F. by the thermometer (the absolute temperature being 10 + 461 = 471 degrees) we look at the above table and find that at sea level with a temperature of (62 + 461 =) 523 degrees absolute the volume occupied by 1 pound of air is 13.14 cubic feet, so we divide 471 degrees by 523 degrees and then multiply the resulting 0.9005 by 13.14 and we find the space occupied by 1 pound of air under these conditions to be 11.83 cubic feet. To express this algebraically:

Let T represent the temperature of our air as indicated by the Fahrenheit thermometer, and let V represent the volume of 1 pound of air at this temperature (T), and let v represent the volume occupied by 1 pound of air, as found in the above table, then

$$V = v \frac{T + 461}{62 + 461}$$

For illustration, let us determine the volume occupied by 1 pound of air heated to 585 degrees F. at the sea level.

V in this case (see table) equals 13.14 cubic feet.

T equals 585 degrees, and by replacing the letters in the formula by these values we have:

$$V = 13.14 \times \frac{585 + 461}{62 + 461}$$

$$\text{or } V = 26.28 \text{ cubic feet.}$$

Thus we see that the volume of our air has been doubled by heating it to 585 degrees F. and we must bear in mind that in devices supplying heated air to our furnaces provision must be made to handle this in-

creased volume of air, the same as when boilers are to be operated at high altitudes, as previously considered.

The more dense the air is the better will be the results obtained in the furnace as far as smokelessness is concerned, and many readers have doubtless noticed on clear cold days in winter how much brighter the fires are than during the hot days in summer.

I have now considered the use of air in combustion under its different conditions, and will next consider the heat value of various fuel constituents found in bituminous coal and note the value of perfect combustion as compared with imperfect combustion.

The heat of combustion developed by burning 1 pound of each fuel constituent in an atmosphere of oxygen is given here in British thermal units, one B. T. U., or heat unit, being the quantity of heat required to raise the temperature of 1 pound of cold water 1 degree F., or from 32 to 33 degrees; 965.7 heat units are required to evaporate 1 pound of water at 212 degrees F. into steam at the same temperature, and 33,305 units of heat delivered (in the steam) from a boiler (in addition to the number of heat units originally contained in the feed water) is commonly considered as equivalent to a boiler horse-power. Supposing our boiler has an efficiency of 75 per cent., for each 44,400 heat units produced by combustion in our furnace we will obtain a boiler horse-power. This statement may hardly be called a scientific one, but it is sufficiently correct for our present consideration.

	Heat units.
One pound of "fixed carbon" burned to carbon dioxide ($C + O_2 = CO_2$)	14,600
One pound of "fixed carbon" burned to carbon monoxide ($C + O = CO$)	4,451
NOTE.—The last example of combustion will result in the production of 2 1-3 pounds of carbon monoxide, which, if united with 1 1-3 pounds of oxygen, will result in the production of	10,093
One pound of carbon monoxide burned to carbon dioxide ($CO + O = CO_2$)	4,325
One pound of marsh gas burned to water and carbon dioxide ($CH_4 + 4(O) = CO_2 + 2(H_2O)$)	23,513
One pound of marsh gas burned to water and with the carbon unconsumed ($CH_4 + 2(O) = 2(H_2O) + C$)	15,525
One pound of marsh gas burned to water, and with its carbon burned to carbon monoxide ($CH_4 + 3(O) = 2(H_2O) + CO$)	16,184
One pound olefiant gas burned to water and to carbon dioxide ($C_2H_4 + 6(O) = 2(CO_2) + 2(H_2O)$)	21,344
One pound of olefiant gas burned to water, with its carbon unconsumed ($C_2H_4 + 2(O) = 2(H_2O) + C_2$)	8,873
One pound of olefiant gas burned to water with its carbon burned to carbon monoxide ($C_2H_4 + 4(O) = 2(H_2O) + 2(CO)$)	12,687
One pound of hydrogen burned to water (which is allowed to liquefy) ($2(H) + O = H_2O$)	62,032

This table might be extended to considerable length to include the various other hydrocarbons and sulphur, but sufficient data have been given to show the loss from imperfect combustion, resulting in the production of smoke. Thus we see that when marsh gas burns only to water and has its carbon unconsumed (producing smoke) the result of such an imperfect combustion is the development of only 15,525 heat units, while had all of its carbon been burned to carbon dioxide (with no smoke resulting) there would have been developed 23,513 heat units—a loss of 34 per cent.

Other examples of loss due to imperfect combustion can be similarly understood by inspecting the table, and this will show us where our principal losses occur when smoke is produced in the furnace, and it is thus easily seen that they may be serious. Conditions which will produce approximately perfect combustion and give us practically smokeless chimneys are therefore well worthy the careful consideration of steam plant owners, aside from the matter of abating the smoke nuisance.

We have now considered the general theory of smoke production, and with these principles before us we can now turn to a consideration of the various methods employed for the suppression of smoke.

A press dispatch from Australia, dated October 4, states that after having made exhaustive trials of American and British built locomotives on the New Zealand Government railways the officials report that the best results have been achieved with the former.

The Philadelphia Foundrymen's Association.

The regular one hundred and twenty-first meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club in that city on Wednesday evening, October 1. The meeting opened at the usual hour, with the president, Thomas I. Rankin, occupying the chair.

The application of the Manufacturing Company, Carlisle, Pa., John Hayes, president, manufacturers of frogs, switches and castings, was received, and they were elected to membership.

The treasurer reported a balance of $2070.82, with all bills paid.

The nominations of officers for the coming year were to be made, but after discussion it was decided to leave the matter in the hands of a Nominating Committee, the president appointing D. G. Moore, Josiah Thompson and G. D. Davis, who will announce the candidates at the next meeting, when they will be voted for.

The paper for the evening was read by J. H. Pepper, the subject being, "A New Kiln and Furnaces and Its Utility in the Manufacture of Malleable Castings." The paper and the discussion which followed will be printed in an early issue of *The Iron Age*.

After the reading of the paper those present adjourned to the roof garden of the club, where the usual luncheon was served. Remarks were made by Thos. I. Rankin, Howard Evans, Josiah Thompson, Oregon J. Ward and others, after which the meeting adjourned. Among those in attendance may be mentioned the following:

Thos. I. Rankin, Abram Cox Stove Company, Philadelphia.
Dr. E. E. Brown, E. E. Brown & Co., Philadelphia.
C. R. Brown, E. E. Brown & Co., Philadelphia.
F. Cooper Pullman, J. Wesley Pullman, Philadelphia.
H. L. Haldeman, Pulaski Iron Company, Philadelphia.
W. J. W. Moore, Pilling & Crane, Philadelphia.
Tom M. Diven, Diven Bros. Foundry Company, Baltimore, Md.
W. T. S. Diven, the Monrose Iron Works, Laurel, Md.
Frank Krug, Dixon Crucible Company, Philadelphia.
James C. Leiper, Brice Pat. Kiln & Furnace Company, 429 Walnut street, Philadelphia, Pa.
John H. Freas, I. A. Sheppard & Co., Philadelphia, Pa.
Paul Vanfleet, I. A. Sheppard & Co., Philadelphia, Pa.
Nicholas Mager, Bethlehem Steel Company, Bethlehem, Pa.
Geo. C. Davis, chemist, Philadelphia, Pa.
H. O. Evans, Thos. Devlin Mfg. Company, Philadelphia, Pa.
F. M. Etting, E. J. Etting, Philadelphia, Pa.
D. G. Moore, S. L. Moore & Sons Company, Elizabethport, N. J.
J. H. Pepper, brass founder and finisher, Philadelphia, Pa.
Thos. J. Kelly, Thomas, Roberts, Stevenson Company, Philadelphia, Pa.
John Hays, Manufacturing Company of Carlisle, Pa.
S. L. Kneass, Wm. Sellers & Co., Philadelphia, Pa.
W. E. Mark, A. & P. Roberts Company, Pencoyd, Pa.
W. P. Cunningham, A. & P. Roberts Company, Pencoyd, Pa.
W. S. Bickley, Penn Steel Casting Company, Chester, Pa.
N. D. Powell, Penn Steel Casting Company, Chester, Pa.
Oregon J. Ward, Howe Scale Company, Philadelphia, Pa.
A. A. Miller, *The Iron Age*, Philadelphia, Pa.
E. H. McCoy, S. G. Flagg & Co., Philadelphia, Pa.
Geo. R. Sullivan, Rogers, Brown & Warner, Philadelphia, Pa.
J. J. McCrystal, Girard Iron Works, Philadelphia, Pa.
Josiah Thompson, J. Thompson & Co., Philadelphia, Pa.
Howard Evans, J. W. Paxson Company, Philadelphia, Pa.

New Mexican Steamship Lines.—The Mexican Government has granted a concession to José Gabriel Escalante of Progreso, Yucatan, for the establishment of a line of steamers to be called the "Yucatan Steamship Line," to ply between Progreso and New York, with the privilege of calling at Vera Cruz, Tampico, Galveston, New Orleans and Mobile. The concessionary is authorized to organize a company and the vessels employed must be owned by the concessionary or the company, or chartered for at least six months at a time. The Mexican mail will be carried free of charge. It is expressly stipulated that the concessionary or the members of the company shall be considered Mexican, and shall be subject to Mexican laws only. The term of this agreement is for three years. Another agreement recently entered into by the Mexican Government was with the Tabasco-Chiapas Trading & Transportation Company of Frontera, Tabasco, for the establishment of steam navigation between Mexican Gulf ports and one or more American ports, Europe and South America, and also in the coastwise trade between Mexican ports.

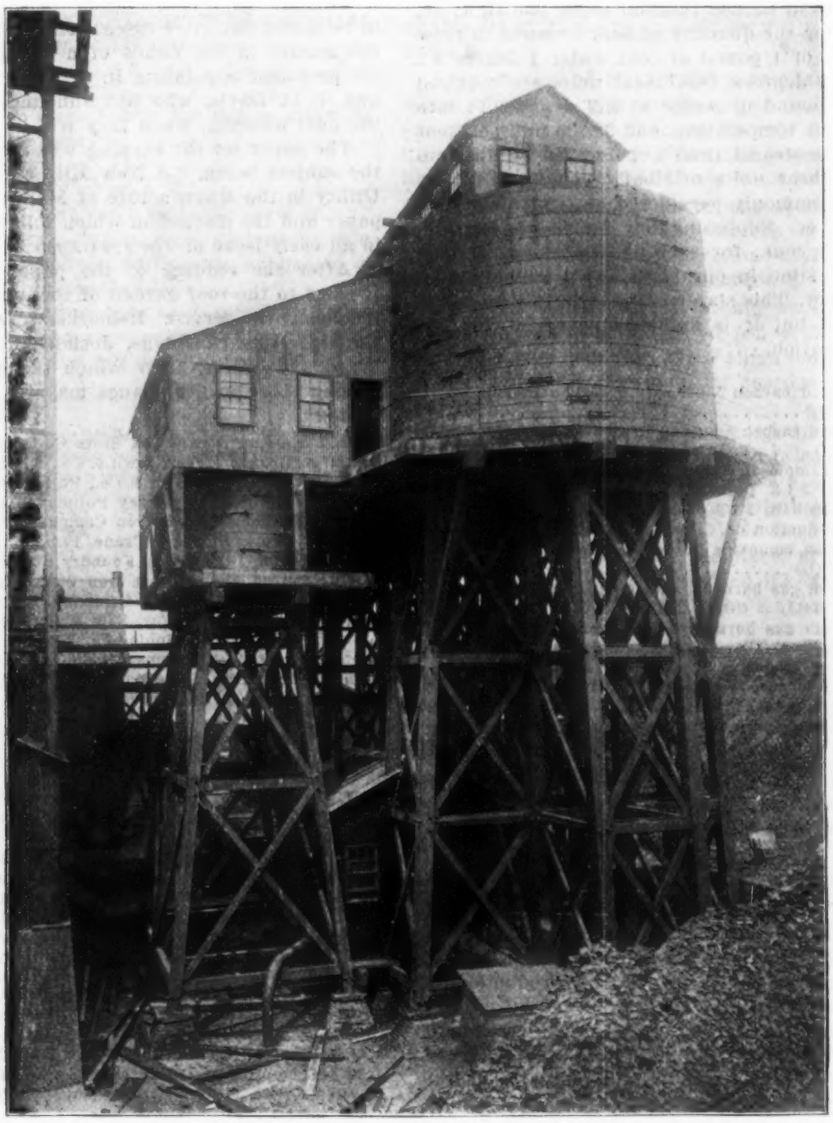
The Chemical Treatment of Water.

BY J. C. WM. GRETH, M.E.

The first thought which naturally occurs in studying this question is the use of some substance which will precipitate the offending material. Lime and magnesia in solution in the water as bicarbonates or sulphates are the most common impurities. Occasionally they are present as chlorides, nitrates or acetates. The latter form being usually due to surface contamination. Numerous substances have the property of combining with lime and magnesia, forming precipitates of varying degrees of insolubility. The market is flooded with substances innumerable, so-called "scale preventives," based upon these chemical reactions.

The next question which naturally arises is to decide the proper time to introduce the substances to bring about precipitation. Anti-fouling boiler compounds are prescribed to bring about the precipitation of the scale forming or corroding substances in the water. Some of them act mechanically, others chemically. Heat and concentration are primarily the causes of the formation of scale in a boiler. The addition of any substance to cause precipitation in the boiler itself only increases the quantity of matter in solution or suspension. Hence it is evident that nothing is gained by introducing anything into the boiler to cause precipitation, as the work of the boiler itself will bring about this result.

The chemistry of this subject, however, is correct and has been well understood for years, but to be effective it must be applied at the proper time and place. The boiler has neither room nor energy to spare for chemical or mechanical operations. It seems but natural that water should be no exception to the general rule that an impure substance should be purified before it is used, not during its use or afterward. Some of the most efficient purifying reagents available for this purpose are those which, fortunately, are among the cheapest chemicals on the market—viz., caustic lime, soda ash (carbonate of soda) and caustic soda. These substances have been used for this purpose since 1841 and their use for softening water is called the Porter-Clark process, named for the discoverers and patentees.



The We-Fu-Go System at the Lucy Furnaces of the Carnegie Steel Company.

THE CHEMICAL TREATMENT OF WATER.

Impurities in Water.

Let us now discuss the more common impurities found in water which either scale or corrode a boiler. The most common, and one found in nearly every water supply, is calcium carbonate. This substance owes its presence almost entirely to dissolved carbonic acid gas. A gallon of water saturated with carbonic acid gas can hold in solution from 60 to 70 grains of calcium carbonate in the form of calcium bicarbonate, nearly all of which is precipitated by boiling, which drives off the carbonic acid which the water contains. The practical success of removing the free carbonic acid in the raw water depends upon the addition to the water at the

proper moment of a carefully determined quantity of lime, causing a precipitate of calcium carbonate. The quantity of lime to be added can always be calculated and checked by means of the delicate silver nitrate test, which indicates by the brown color of the precipitated oxide when the slightest excess of lime has been added.

Carbonate of magnesia, though much more soluble in water than carbonate of lime, is usually met with in small proportion, seldom exceeding, according to the writer's experience, 10 or 15 grains to the United States gallon. It can easily be removed from the water by treatment with lime, but it is very soluble in water quite free from carbonic acid. It is usually supposed that by simply removing the carbonic acid from the water the magnesia, assumed to be present in the form of the bicarbonate, will be precipitated as a carbonate of magnesia. This, however, is not the case. The magnesia will not be thrown down unless enough lime is added to completely decompose the carbonate of magnesia into the insoluble hydrate. We therefore obtain two insoluble substances—magnesium hydrate and the calcium carbonate. As the traces of dissolved magnesiumh hydrate react like lime in the test with silver nitrate, the yellow or pale brown color is obtained before sufficient lime has been added to decompose the whole of the carbonate of magnesia. On this account the softening of the water containing both carbonate of lime and carbonate of magnesia is frequently limited to the removal of the carbonate of lime and magnesia purposely left in the water. This can, however, by proper treatment of the water, be entirely removed by adding lime in slight excess, almost perfect clarification resulting by subsidence.

Sulphate of lime, or calcium sulphate, is one of the most objectionable constituents of boiler water on account of the hard crystalline scale which it produces. It does not owe its solubility in water to the agency of carbonic acid, but is dissolved by the water itself, and is one of the exceptions to the general rule that hot water dissolves more of this substance than cold. The solubility increases from 32 degrees to 104 degrees, at which temperature it diminishes very slowly at first, then rapidly and then more slowly again. It has been stated on good authority that calcium sulphate is quite insoluble in water at a temperature of 302 degrees F., or the equivalent of boiler pressure of 55 pounds. Analyses of blow off water made by the writer frequently show as high as 25 grains to the gallon in water operating under a pressure of from 100 to 125 pounds (the equivalent of 337 to 352 degrees F.); hence the precipitation of calcium sulphate in a boiler is due to some other cause than temperature. This other cause can be nothing else than concentration. This accounts for the frequent failure of live steam purifiers in waters containing calcium sulphate, inasmuch as concentration cannot take place in an apparatus of this kind. The treatment ordinarily used for the precipitation of calcium sulphate in a chemical treatment of water is sodium carbonate, commonly known as soda ash. This decomposes the calcium sulphate and precipitates it as calcium carbonate, leaving the calcium sulphate in solution. The latter substance is perfectly neutral and does-

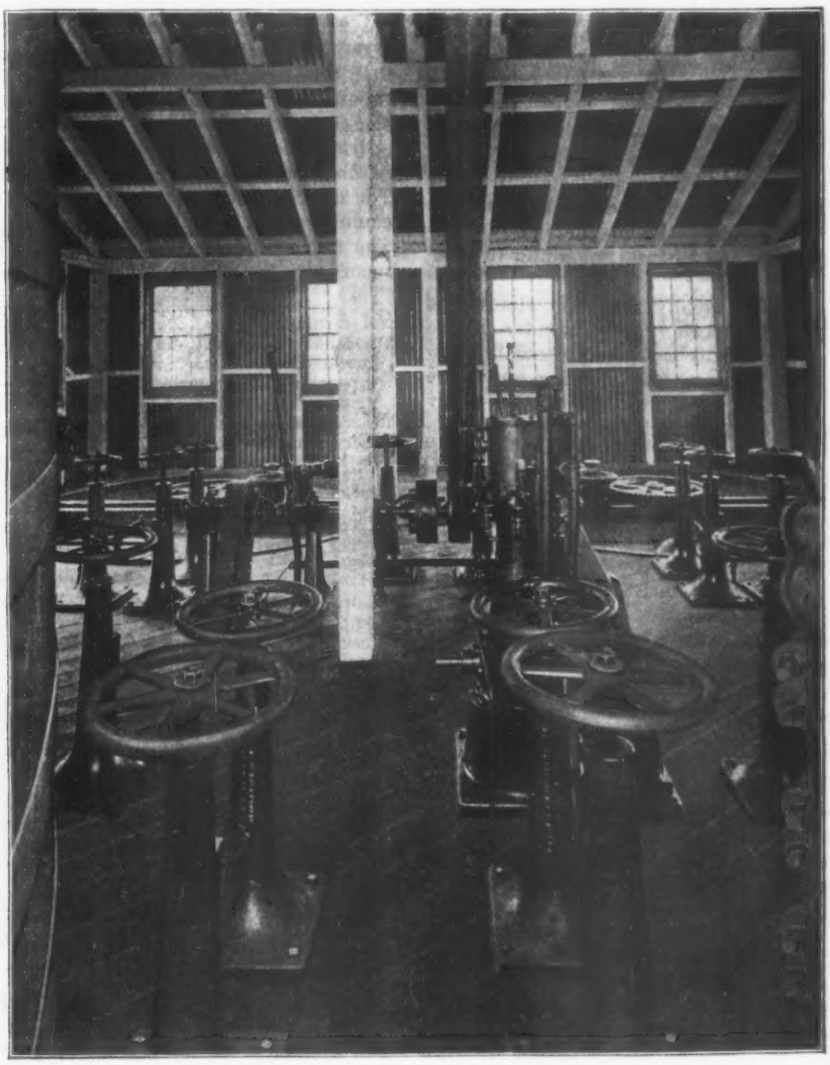


Fig. 2.—Operating Floor, 6000 horse-power, We-Fu-Go System at the Lucy Furnaces.

THE CHEMICAL TREATMENT OF WATER.

not affect the hardness of the water, is very soluble and does not form scale. The increase in total solids is very slight, 136 parts calcium sulphate being replaced by 142 parts of sulphate of soda.

Sulphate, Chloride and Nitrate of Magnesium.—These substances are held in solution in practically the same manner and follow the same general laws as calcium sulphate. Sulphate of magnesia may prove a highly objectionable substance if allowed to concentrate in the boiler. A soft carbonate of lime incrustation, when boiled with a solution of sulphate of magnesia, is transformed into sulphate of lime and basic carbonate of magnesia. The latter under high temperature changes into hydrate of magnesia and the two together form a hard scale resembling porcelain. Chloride and nitrate of magnesia are objectionable owing to their corrosive character. They can be removed by the use of caustic soda or by adding lime and soda ash in proper proportions, the magnesia compounds being decomposed and precipitated as hydrates.

Chloride and Nitrate of Calcium—Are sometimes met with in hard water. These are very soluble and do not enter into the composition of boiler incrustation. They are decomposed by sodium carbonate similarly to calcium sulphate, the calcium being precipitated as carbonate, sodium chloride and nitrate remaining in solution.

The above substances usually make up almost the entire analysis of boiler scale, the remainder of the analysis of scale being usually composed of small quantities of silica, oxides of iron and alumina and some organic matter. Most of these can usually be easily precipitated with the calcium carbonate and other precipitates.

The We-Fu-Go System.

Of the various systems on the market the following is a description of the one which is known as the We-Fu-Go system, manufactured by Wm. B. Scaife & Sons Company, Pittsburgh.

In this system known quantities of water are treated at all times, so that even with a varying water supply the treatment can be kept accurate by the simple test described above. The illustrations show the apparatus as installed in one of the plants of the Carnegie Steel Company. It consists essentially of two settling tanks and a small chemical tank, with the necessary pipe connections to admit the raw water to either one of the settling tanks or to the chemical tank; pipe connections to draw off the soft water from either settling tank at the top by means of a hinged floating outlet pipe, and a waste or wash pipe by which to get rid of the sludge collected in the bottom of either settling tank.

The method of operation is as follows: The left hand tank is filled with raw water, and when filled the exact amount of chemical reagents is weighed out and put into the small chemical tank, water is added and all is washed into the settling tank. The water is then stirred by power to make a complete and intimate mixture between the chemical reagents and the water. It is then permitted to stand while the precipitated iron, lime and other impurities settle to the bottom of the tank. In order to remove any floating sediment which may not have settled in the tank the water is passed through either a gravity or pressure filter, as the local conditions of floor space and operation of the plant show to be best suited. If the gravity filter is used the water can be taken direct to the boiler feed pump through the heater into the boiler, or, as is the case in the plant illustrated, an open heater is used and the water is taken by gravity to the heater from the filters. The advantages claimed for this system are: The heater is kept clean and the feed water can be raised to a higher temperature; the boiler is kept clean; the old scale is loosened by no other means than purified water; the full benefit is obtained from the high evaporating powers of improved water tube boilers, and there is no danger of a tube becoming full of scale and of burning off and leaking.

In the United States Circuit Court at Denver, on the 2d inst., Judge Caldwell signed an order in the Colorado Fuel & Iron Company case. The substance of the order, which was drawn under the court's instructions by the attorneys for the Gates interests, is that the officers of the company at once issue a call by the regularly prescribed means and that the annual election be held December 10. Seymour D. Thompson of St. Louis, Master in Chancery, is to supervise the election, and the company's officers are to submit to his supervision in making the preliminary arrangements for the meeting.

The American Shipbuilding Company.

The annual report of the American Shipbuilding Company for the 12 months ended June 30, issued October 1, reflects the heavy increase in lake traffic during that period. The statement shows net earnings of $2,507,551, an increase over the preceding year of more than $500,000. The total surplus for the year shows an expansion of $1,184,257. At the annual meeting of the stockholders on that day, held in Jersey City, N. J., the retiring Board of Directors was re-elected. Subsequently the board organized by re-electing the retiring officers. The directors declared a dividend of 4 per cent. on the common stock, payable in four quarterly installments. The first disbursement will be made December 1. The report sets forth these figures:

	1902.	1901.	Increase.
Net earnings	$2,507,551	$1,998,542	$509,009
Dividend, 7 per cent. on preferred	553,000	553,000	.....
Depreciation and maintenance	420,294	271,905	148,389
Reserve for maintenance	200,000	.....	200,000
Reserve, Buffalo mortgage	150,000	.....	150,000
Surplus	$1,184,257	$1,173,638	$10,619
Previous surplus	1,742,304	568,666	1,173,638
Total surplus	$2,926,561	$1,742,304	$1,184,257

The general balance sheet as of June 30 shows:

	Assets.		
Plants and properties	$14,993,297	$14,633,683	$359,614
Additions and improvements	190,414	359,614	*169,200
Materials on hand	640,560	549,315	91,245
Accounts and bills receivable and cash	3,258,888	1,976,155	1,282,733
Work under construction	1,076,728	1,187,545	*110,817
Totals	$20,159,887	$18,706,312	$1,453,575
	Liabilities.		
Capital stock, preferred	$7,900,000	$7,900,000	.....
Capital stock, common	7,600,000	7,600,000	.....
Accounts payable	883,326	1,214,009	*$330,683
Bills payable	500,000	250,000	250,000
Reserve funds	350,000	.....	350,000
Surplus	2,926,561	1,742,303	1,184,258
Totals	$20,159,887	$18,706,312	$1,453,575

* Decrease.

President W. L. Brown says in his annual report: "During the year the physical condition of each plant has been kept to the highest standard of efficiency as far as possible, the expense incident to this having been charged to operating expenses. It has been found necessary to enlarge the foundry and pattern shops at Detroit, to erect some new buildings at West Superior, to make some alterations and repairs at Buffalo and to add some new tools and machinery at several of the plants; this work is now in progress and to pay for it a special sum of $200,000 has been set apart, as shown in the treasurer's report. Work done and under construction is as follows: Vessels built, 41; carrying capacity, net tons, 198,500; vessels under construction, 30; carrying capacity, net tons, 139,900. The construction during the year has comprised many kinds, ranging from the standard bulk and package freight carriers, for both lake and salt water traffic, to the most modern and highest type of passenger steamers, the various plants of the company demonstrating full ability to build and equip all classes and types of the highest class and best construction. The annual increase in lake traffic makes it fair to assume that there are likely to be continued construction and gradual replacement of out of date tonnage and hence a fair future business in this line of work for the company."

International Progress in Standardizing.

Observations Abroad by Director Stratton.

WASHINGTON, D. C., October 4, 1902.—Director S. W. Stratton of the new National Bureau of Standards, who has just returned to Washington after an extended tour of Europe, made for the purpose of inspecting the leading foreign government institutions covering approximately the field to be embraced by the National Bureau, has made some interesting statements to the correspondent of *The Iron Age* with regard to the efforts being made by the governments of the principal countries of Europe to co-operate with their manufacturers in improving the quality of their output and extending their trade throughout the world. In England, France and Germany especially he found that the governments were preparing to assist producers in solving technical problems, in standardizing products and in supplying the most reliable information with regard to foreign markets. In all these countries he found the leading men among both Government officials and manufacturers paying the closest attention to industrial progress in America and preparing to profit by every lesson to be learned.

"Although somewhat familiar with the general scope of the leading institutions of Europe," said Director Stratton, "I was surprised to note the extent to which they are now co-operating practically with the manufacturers in their respective countries in bringing their products up to the very highest standard. I found everywhere I visited the liveliest interest in what American manufacturers are doing, especially in the production of iron and steel, and the feeling is general that with the enormous resources of this country and the energy and enterprise of our people it will be necessary for European manufacturers to strain every nerve to maintain control of their own markets. The Government officials seem specially aroused to the progress being made in this country and propose to leave no stone unturned to aid their own manufacturers to keep abreast of the very latest developments.

"The leading institution in England now preparing to co-operate with British manufacturers is the new National Physical Laboratory at Bushy Park. This institution will make a specialty of problems in metallurgy and is receiving the very hearty co-operation of the leading iron and steel makers of England. Plans are being made for exhaustive studies of the physical and commercial structure of steel, for investigations of alloys and for the testing of all instruments for measuring high temperatures, &c. The work of this institution was specially interesting to me and we hope to follow a similar line when the Bureau of Standards takes possession of its new home. It is our purpose to provide facilities for studying scientific problems arising in the industrial arts, and in time to create an institution to which manufacturers can apply for advice on a great variety of subjects.

"The French Government is devoting much attention to these questions and I found the Conservatoire des Arts and Nature building a very large laboratory for testing materials used in all branches of engineering and for experimenting with technical processes, &c. In addition facilities have been provided for testing and standardizing motors, machines, measuring instruments of all kinds, &c., the chief object being to aid French manufacturers in all directions. The French take a view with regard to their manufacturers similar to that which is exemplified in our system of helping the farmers by the distribution of scientific information. In this country we maintain an agricultural experiment station in each State and a central station in Washington, and the results of tests and investigations made at all these stations are speedily communicated to the farmers of the country through bulletins issued periodically and through annual departmental reports. This system has attracted much attention in France, and on the ship by which I returned was a distinguished scientist visiting this country to inspect our work in this direction for the benefit of his Government. I do not see why we should not do through the National Bureau of Standards a similar work for our manufacturers, and I believe the results will amply justify the establishment of the institution.

"In Germany I inspected what is doubtless the leading technical laboratory of Europe, the Reichsanstalt, the work of which is more comprehensive than that of any other similar institution. At present its functions are divided into two parts, the first part being devoted exclusively to problems relating chiefly to pure science, while the second is given up to technical researches, to the standardization of instruments and machines of all kinds, including electrical apparatus, pyrometers and other meters and all standards not included in the category of ordinary weights and measures. The standardization of simple weights and measures is a function of the Normal Achnungs Commission. The work of the commission and the Reichsanstalt is correllated in such a manner that they might well be considered as a group of scientific laboratories established to promote the application of science to the manufacturing industries. Taken together they constitute perhaps the closest European prototype of what we hope our National Bureau of Standards will be in the course of time.

"The value of the work of the Reichsanstalt to German manufacturers could hardly be overestimated. It has given German manufacturers in several important lines a world wide reputation for the accuracy and reliability of their products, and I was interested to observe that among the many instruments to be seen in the different departments of the institution waiting to be tested and standardized were a number made by leading manufacturers in the United States. It is certainly highly suggestive that our manufacturers must send their products all the way to Germany to receive the hall mark of a foreign institution.

"While in Germany I visited the Düsseldorf Exposition and was much impressed with the splendid showing made by the German manufacturers of iron and steel. One expects, of course, to find an excellent exhibit by the Krupps at any European exposition and their installation at Düsseldorf probably represented a special expenditure of several hundred thousand dollars, but there were half a dozen other manufacturers making most creditable exhibits, including castings and forgings of extraordinary size as well as all forms of finished steel. The exposition would have repaid any American manufacturer for a trip across the ocean, and the quality of the exhibits shows that German producers are able to turn out the very highest grades of materials."

Director Stratton noted a great deal of interest in England in the adoption of the metric system and in the development of sentiment with regard to the system in this country. The recent action of the colonial premiers in adopting resolutions recommending the system has revived general interest in the matter, and a change not only in the present system of weights and measures, but also in the coinage, is being favored by many public men who have heretofore paid little attention to the matter. The International Congress of Commerce and Industries, held at Ostend during the summer, after an extended discussion expressed its unanimous opinion in favor of the adoption of the system, and Harold Cox, the British commissioner, was one of the strongest advocates of the change. W. L. C.

The Carriage Builders' National Association held their annual convention in Detroit last week. President Henry C. Staver of Chicago in his annual address made a strong plea for the ratification of the pending reciprocity treaties, alleging that this country now produces $4,000,000 daily in manufactured products more than it can consume, and that something must be done to get rid of the surplus. E. W. M. Bailey of Amesbury, Mass., was elected president for the ensuing year.

A cargo of 3000 tons of pig iron from Middlesbrough, England, recently unloaded at South Boston, is said to be the first full cargo of English iron received at that port for 15 years.

Scientific and Technical Notes.

A striking example of the economy to be obtained from the use of superheated steam is to be found in the records of a test made on the flash boiler of a White automobile. With one of the engines working at about 5 horse-power, the consumption of steam was less than 25 pounds per brake horse-power hour. The usual consumption in engines of this size using saturated steam is from 75 to 200 pounds. The difference is mainly due to the initial condensation of the steam upon the cylinder walls, which is largely prevented by superheating, and which may be entirely eliminated if superheating be carried far enough. In any case, the larger the engine the less the relative area to produce condensation and the more efficient the engine. This 5 horse-power engine, however, proved as economical as the average Corliss noncondensing engine of 100 horse-power; and as economical as a condensing engine of large size, using single valves and saturated steam. Thoroughly superheating the steam places similar engines of different sizes much more nearly upon the same plane, so far as economy goes.

In an interview on the subject of the present distressing coal situation, Dr. Thurston says: "Blessings are sometimes so completely disguised that it is only after the crisis has passed and the truth is revealed by experience that it becomes evident that a disagreeable experience is simply preliminary to permanent advantage. Anthracite coal is found only in a limited area. Relatively, the quantity known to be available as compared with the amount of bituminous coal accessible is very insignificant. Its rarity makes it comparatively costly, and control of it can be secured by what may now be regarded as a moderate amount of capital. In fact, it has already become a luxury in the sense that it costs twice as much as equal amounts of other forms of fuel. It is well understood that the whole stock of anthracite will be completely exhausted, for industrial purposes at least, within a generation or two, and practically for all purposes within the century. There could be no better time to acquire skill in handling soft coal than the present. Anthracite will be scarce and high in price for a long time to come, even if the mines reopen immediately. Bituminous coal can now be had at a fraction of the price of the hard coal, and the discrepancy will probably rapidly increase. Soft coal will never be as cleanly or as satisfactory for domestic purposes as hard, but it has advantages besides its low cost. It is a free burning fuel, quick of action in the stove or furnace, easily and quickly lighted and almost as rapid in its production of heat as a wood fire. It is liable to smoke when not well handled, but it is easy to learn the art of using it and to reduce the amount of smoke to a bearable quantity. It can be used in stoves and grates and furnaces constructed for use with anthracite. A little practice and large patience, now that we are in a measure forced to face the possibility of its compulsory employment, will very possibly spare us much trouble and some expense later; and will still more profitably aid our children in their generation."

The invasion of Great Britain by American manufacturers has recently been made prominent by the equipment of the Mersey Tunnel Railway, between Liverpool and Birkenhead, with electrical power supplied by generators and engines built by the Westinghouse Electric & Mfg. Company and the Westinghouse Machine Company, respectively, of East Pittsburgh. There are four vertical cross compound engines of 1500 horse-power each, running at 90 revolutions per minute, and direct connected to railway type generators of 1200 kw. capacity at a pressure of 650 volts. In addition, there are supplied for lighting purposes two compound wound generators of 200 kw. each at the same voltage of 650. Between terminals the road is about 4.5 miles long, and is double tracked. The current is supplied by means of the conventional third-rail system, but to avoid disastrous electrolytic action it is carried back by means of a fourth rail, situated between the running rails. The two rails for carriage of current are mounted on stoneware insulators and weigh 100 pounds per yard, while the running rails weigh only 86 pounds.

Steam turbines are giving every evidence of having come to stay. One of the latest installations is in the power plant of the New York Rapid Transit Subway, where three sets of turbo generators of 1250 kw. each will be used to light the subway and stations and the power house itself. The most striking constructive feature in these machines is the introduction of a reheater between the high pressure cylinder and the low pressure, thus necessitating the separation of the cylinders. This allows the placing of a bearing between cylinders, and by lessening the distance between bearings permits the use of a much lighter shaft, while at the same time opportunity is given for the reheater to perform the function which justifies its adoption—the superheating of the working fluid just prior to its entry into the large cylinder. It is, of course, intended that superheated steam shall be used in the high pressure cylinder. The importance of this requirement is seen from the fact that whereas with dry steam the guaranteed consumption at full load is not to exceed 15.5 pounds per electrical horse-power hour, a superheat of 75 degrees F. cuts this figure down to 13.9 pounds, with a corresponding reduction in the coal bill. At lower loads the ratio of increased efficiency due to superheating slowly increases. The total floor space occupied by the three machines, with all passageways included, will be 1824 square feet. The net area is 945 square feet, or about 0.2 square foot per electrical horse-power, as compared with 0.86 square foot for three equally powerful Corliss cross compound engines with generators. The speed of revolution will be 1200 turns per minute, which, with six poles, gives a frequency of 60 cycles per second.

A promising method of reducing bearing friction is the use of some form of a roller bearing. One of the latest types, the Hyatt, has, instead of solid rolls, a series of coil springs. These are so flexible in use that a slight derangement of the axis of the shaft will not throw the journal upon one edge of the rollers, as is the case when they are solid; but the springs will retain contact along the entire length, thus minimizing wear on both journal and bearing. Another advantage lies in the fact that the roller acts as an oil reservoir, while roller and spiral together perform the function of an oil carrier. This makes perfect lubrication automatic and largely diminishes the amount of attention required by the bearing.

A novel method for the production of calcium carbide, says the *Electrical World and Engineer*, proposes, as an alternative to the usual practice of heating a suitable mixture of lime with carbon, to first fuse the lime in an arc furnace and then discharge the molten mass into an excess of heavy hydrocarbon, such as "masud," or other residue of petroleum distillation. The formation of the carbide occurs within the body of the hydrocarbon, and the product possesses, as would be expected, some distinctive properties; it is loose and noncoherent, and is saturated throughout its mass with the hydrocarbon, which modifies its relations with water, rendering it practically nonhygroscopic. It is peculiarly adapted for the intermittent generation of acetylene, since it is not penetrable by water and the evolution of gas continues only during the period of actual immersion. It is asserted also that it is free from phosphorus, which is eliminated by forming with the hydrocarbon volatile hydrides.

During the 1902 French naval maneuvers the electric submarine boats "Gymnote" and "Gustave Zede" scored against the three battle ships. This type of underwater war ship has apparently a future ahead of it, and the French, by reason of many experiments on craft of different sizes and designs, seem to be a little in the lead in its development. Our own Holland boats are very well designed and manageable, but have not

yet been so thoroughly tested as have the French boats. With this class of warfare the most serious difficulty is not connected with either the structure or the motive power, but is the much more fundamental one of an inability to see through the water to any considerable distance. So great is this disability that it is an exceedingly difficult matter to discover the object of attack. To meet this problem various forms of telescopic eyes have been devised, operating more or less upon the camera obscura principle; but this is only a partial solution, at best, for nearly all the work of such a craft would have to be done at night, and the view obtained with this complex form of apparatus is necessarily meager. However this question may finally be disposed of, the main reliance to be placed on submarine craft, for the immediate future at least, is based upon the moral effects due to the known presence of such dangerous adversaries in the immediate vicinity. There seems to be no reply possible to such a deadly attack. A system of the boats themselves could find their adversaries only by chance, and even then have no present means of fighting them, as their entire offensive equipment is directed to the purpose of destroying large vessels of the nonsubmergible type. Thus it is that future blockades will be rendered extraordinarily hazardous; and where submarine boats are at all in evidence no repetition of the Santiago blockade will be possible.

The New Yankee Arbor Press.

The new Yankee arbor press, built by the Wilmarth & Morman Company of Grand Rapids, Mich., is intended for driving lathe arbors and straightening work. It has

THE NEW YANKEE ARBOR PRESS.

a coarse pitch, double thread screw and a hand wheel with heavy rim, the inertia of which is utilized to force the arbor tightly into the work bore. By the use of this combination a great driving effect is produced. The inertia of the hand wheel is made use of for giving the arbor two or three final impulses after it has been forced down as far as can easily be done by turning the wheel in the ordinary manner, the leverage being 47 to 1. It should be understood that the thread is of so coarse a pitch that the screw will never lock on the work, and when turned down quickly on a tight fitting mandrel will be repelled and turn in the opposite direction. Its action is much quicker and it requires much less exertion to operate than the ordinary screw press. The arrangement of the jaws on the anvil is such as to accommodate mandrels of different diameters. They open and close in unison, so that the work is always central under the screw and arbors can be easily forced in or out of thin bushings. To straighten shafts, &c., the jaws are opened some distance and the pressure applied centrally between them.

With one hand on the work and the other at the hand wheel, the ram may be brought down with an easily gauged force and the work quickly straightened almost without leaving a mark on it.

Hard wood strips are inserted in the bottom so that when bolted to a lathe bed no damage will be done to the ways, and lugs keep the press forward to prevent the arbors marring the front edge.

The Alliance Machine Company.

The Alliance Machine Company, Alliance, Ohio, builders of electric traveling cranes, special electrically operated machines, rolling mill and special machinery, hydraulic riveters, flanges and punches, are operating their plant to its fullest capacity, and though it was only completed the early part of last June they are already considering the erection of two or more buildings of about the same size as the present one to take care of their increasing business.

The plant is located on a 15-acre site on the Cleveland & Pittsburgh Railroad, and is connected by switches with the main lines of the Pennsylvania & Lake Erie and Alliance & Wheeling railroads, affording excellent shipping facilities. Everything connected with the works has been planned with a view to the greatest convenience and economy and none but the most modern equipment has been installed. The main building is 120 x 300 feet, of brick and steel construction, with practically all glass sides above the sills. A 30-ton traveling crane, 60 feet span, commands the shop, and running the entire length of the building is a depressed track so that the floors of the cars are in line with the floor of the building.

At this time the company have the following contracts: Colorado Fuel & Iron Company, Pueblo, Col., three 10-ton, four 15-ton, two 20-ton, one 25-ton and two 50-ton cranes; Carnegie Steel Company, Pittsburgh, two 10-ton, one 25-ton, one 75-ton crane, and one 10-ton three-motor crane, 41 feet span; Worth Bros. Company, Coatesville, Pa., four 10-ton, one 50-ton crane, and one 15-ton, four-motor, 56-foot span, special soaking pit crane; American Steel & Wire Company, Pittsburgh, one 15-ton crane; Bethlehem Steel Company, South Bethlehem, Pa., one 100-ton crane; Union Steel Company, Pittsburgh, three 5-ton, five 10-ton cranes and one 10-ton scull cracker crane; Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, two 15-ton four-motor cranes, 60 feet span; Alabama Steel & Wire Company, Birmingham, Ala., one 15-ton four-motor crane, 60 feet span, and one 15-ton three-motor crane, 60 feet span. Besides these they are building two traveling tables for the 35-inch beam mill at the Homestead Works of the Carnegie Steel Company, which are said to be the largest traveling tables ever designed. They will have a capacity of carrying 24-inch beams, 100 pounds per foot, from hot beds to the finishing rolls. The company are also building 12 rod reeling machines for the Colorado Fuel & Iron Company. These machines were designed by the Garrett-Cromwell Engineering Company of Cleveland, and will be used in the new mills of the Colorado company, now in course of construction at Pueblo.

The officers of the Alliance Machine Company are W. C. Whitehead, president; W. H. Purcell, formerly a director and general manager of the Morgan Engineering Company, secretary and general manager, and M. S. Milbourn, treasurer.

The Scully Steel & Iron Company.—The Scully Steel & Iron Company, Chicago, have increased their capital stock from $25,000 to $1,000,000. The company began business in 1891, and the increase in capital stock now made represents the earning capacity of the company based upon the growth of business during the past ten years. No outside capital is introduced, the surplus of the company being ample for all requirements.

The Christensen Engineering Company of Milwaukee have just completed the foundation for a 250-foot extension to their main machine shop, which is 186 feet wide. The new building will be three stories and will provide 88,000 additional square feet of floor space.

Presentation to President McMurtry.

A very pleasant affair occurred on Saturday evening, October 4, at Vandergrift, Pa., where the large sheet mills of the American Sheet Steel Company are located. This was the presentation to George G. McMurtry, president of the American Sheet Steel Company, by the employees of the Vandergrift plant, of a massive punch bowl, designed by Tiffany & Co. of New York. The presentation was a surprise to the recipient, and in order to have the presence of Mr. McMurtry at Vandregrift on Saturday evening it was necessary to use some subterfuge to get him there. Eugene W. Pargny, manager of the Kiskiminetas Valley mills, embracing Vandergrift, Hyde Park, Saltsburg and Leechburg, went to New York and notified Mr. McMurtry that it would be absolutely necessary for him to be in Vandergrift on Saturday, October 4, to attend an important meeting of the officials of the Apollo Iron & Steel Company. Mr. McMurtry agreed to be present and arrived in Pittsburgh on Friday evening, going to Vandergrift the next morning. He was kept in complete ignorance of the real purpose of having him there and it was the intention to have the presentation occur in a grove located on the property of the American Sheet Steel Company, but owing to inclement weather the exercises were held in the Casino Building. More than 2000 persons were present, taxing to the utmost the capacity of the hall. After Mr. McMurtry and a number of other gentlemen connected with the Vandergrift works had been seated on the stage an address of welcome was delivered by Eugene W. Pargny, which was in part as follows:

I think you will all agree with me that to-day we have reasons to congratulate ourselves upon more than one feature, but what in reality brings the greatest joy to our hearts is the presence of our beloved friend and president, who was summoned to Vandergrift at this time, ostensibly for business reasons, but within the next hour the true purpose of having him with us will have been demonstrated, and then I hope we shall all have his forgiveness for not confining ourselves to actual facts when approaching him upon what is really to take place here to-day.

Therefore, Mr. McMurtry, allow me to say that while it is, generally speaking, an easy matter to do pleasant things, and while any one would feel complimented to be asked to extend to you, in behalf of your many friends gathered here to-day, a most cordial welcome, yet to accord you the welcome that you so richly deserve and to express the enthusiasm that exists in the hearts of your friends in meeting you to-day, I fear I shall fall short in doing the occasion, even in part, justice. However, let me assure you that all of these good people present have been eagerly awaiting the arrival of this day in order that they might demonstrate the true feelings of love and appreciation that exist in their generous hearts for the man who has made it possible for them to have what no other industrial community, either in this country or abroad, can lay claim to.

By your wonderful foresight, untiring efforts and deep seated interest in the welfare of your coworkers you have made possible within the short space of seven years the development of a district from practically a barren field into what one of our own associates has happily termed "A workingman's Paradise;" therefore, no wonder that this large concourse of men, women and children is here to-day to do you homage; and while I know full well how averse you are toward any reference whatever to matters affecting your own self, yet you must permit us to speak plainly to-day and give vent to those feelings which, by reason of your extreme modesty to hear the truth about yourself, have lain silent within us for so long.

This is a day of general rejoicing, not only for what we have in this valley, and particularly in this beautiful model town, but because we have you with us—you, of whom no man can say other than that you have always been an indefatigable worker in behalf of those associated with you, ever having in mind the comfort and welfare of your employees and the desire to aid them to progress, and following up these sentiments with substantial assistance, thereby bringing about a realization of your laudable ambition for those associated with you, and in consequence you have gained their love and esteem and the name of being a true friend of the workingman.

There are many things commendable to yourself which I should like to dwell upon, but the men themselves suggested this occasion and they have something to say to you which I believe you will be glad to hear. I take pleasure in introducing our friend and co-worker, Joseph T. Dougherty, who will voice the sentiments of his comrades.

Mr. Pargny's speech was received with enthusiasm and he was followed by Joseph T. Dougherty, a roller in the Vandergrift works, who spoke at much length and with great feeling. His remarks were in part as follows:

Here upon this platform stand the two great factors in human existence—Capital and Labor—the one just as important as the other; the one cannot survive without the other; but on this we will not dwell. Let us look rather to the relations existing between them; capital on the one hand doing all it can to promote the interest of the laboring classes, by paying good wages, giving steady employment, encouraging them to build and own their own homes and educate their children; labor, on the other hand, by sobriety, industry and the careful handling of the trust reposed in her, is doing much to advance the interest of capital; no strife, no envying, but all is peace and harmony, each endeavoring to do whatever is possible to help the other. What an inspiring sight, what a valuable lesson to those whose interest has been only for self and who have never weighed the question of mutuality. Then, best of all, we remember that this is no new experiment; indeed, it has passed the experimental stage, it has been proven and tried by years of experience, it has stood the test of times prosperous and times of peril, and love is the secret of it all, the employer's love for his workmen, the workmen's love for their employer and managers.

Gitto has a famous painting in which he represents a beautiful woman standing upon bags of gold, reaching one hand into the open heavens, out of which an angel is extending a human heart; the human heart is worth more than the bags of gold.

The conditions in Vandergrift to-day are due largely to a policy of this kind, of keeping the hearts of the working people above the bags of gold. When this policy becomes more universal much will have been done to solve the problems in the industrial world.

We have not, however, assembled here to-day to discuss the labor question, but we have met to pay our tribute to one whom it delights the people of this valley to honor. The memories of Washington, Lincoln, Grant, Garfield, McKinley and a host of others are dear to the hearts of every patriotic citizen in this grand old Union of ours, but there is no mortal man dearer to the hearts of these sturdy steel workers than is their beloved friend, president and benefactor, George G. McMurtry.

After describing in poetical language the character of the gift which he was presenting, Mr. Dougherty concluded as follows:

So Mr. McMurtry, as an expression of our gratitude for all these things, in the name and by the authority of the 3200 employees of the Kiskiminetas Valley mills, representing not only one plant but every plant, not only one department but every department, not one class of men but all classes, from those lowest in rank to the highest in authority, I present you with this token of our love and esteem. Accept it, and as often as you look upon it think of those dear friends in the peaceful valley of the Kiskiminetas, whose loyalty toward and love for you will be as lasting as is the metal out of which this token is made.

It is hardly necessary to say that Mr. McMurtry was completely surprised and, in fact, was almost overcome with this token showing the esteem in which he is held by the men who have grown up in the Vandergrift works and who regard him as their friend. Mr. McMurtry made a few short remarks, stating that he hoped the pleasant relations that had existed between himself and the men would continue for many years to come and that he desired always to be considered as their true and loyal friend. He said that it gave him great pleasure to know the splendid condition of the mills, adding that it was a testament of the skill and careful management which operate them. He closed by assuring those present that the gift was highly appreciated and would always be retained by him as showing the warm affection of the men.

The punch bowl presented to Mr. McMurtry required four months to make. It is a massive piece of *repoussé* and modeled work. It is about 16 inches in hight, 18½ inches in diameter and has a capacity of 20 quarts.

The outside of the bowl is richly ornamented with

several medallions, which are encircled by wreaths of laurel and ivy leaves, symbolical of success and friendship, and further enriched by bunches of grapes, modeled in full relief and giving a most pleasing effect.

The bowl itself is of a plain hemispherical shape and is supported upon four plain columns. In the various medallions are shown a finely chased portrait of Mr. McMurtry and under it the inscription, "A lovable character and possessor of many noble qualities, who by his generous deeds has proven himself a true friend of the workingman;" also views of Vandergrift, very plainly chased in silver, showing the Casino, the site in 1895, the present works, and scenes in the processes of casting, galvanizing, annealing and blooming. Underneath the bowl and between the supporting columns is a perfectly modeled miniature sheet mill, with the men in their natural positions when putting a sheet of steel through the rolls. The figures were carefully modeled from life and the whole scene is a wonderfully true representation of the operation which it depicts.

On the base upon which the columns rest are ornamental shields bearing the Caduceus, the rod of Mercury and symbol of commerce, and branches of laurel suggesting the "success" of the recipient in his business career.

The inscription in bold letters encircling the top of the bowl reads: "Presented to President George G. McMurtry by the employees of the Kiskiminetas Valley mills."

A ladle of appropriate size and very richly chased accompanies the punch bowl. Both the bowl and ladle are gold lined.

Mr. McMurtry, not to be outdone by those who had planned this pleasant surprise for him, announced at the close of his remarks that he would present a pipe organ to each of the churches in Vandergrift. As there are six Protestant churches and one Catholic church in Vandergrift proper, and also two churches in Vandergrift Heights, Mr. McMurtry's offer means that he will give nine pipe organs to these institutions.

The Morgan Ocean Combination.

The International Mercantile Marine Company were incorporated September 30 in Trenton, N. J., by amending the articles of incorporation of the International Navigation Company, thus completing the Atlantic shipping consolidation, arranged by J. Pierpont Morgan. The amended certificate authorizes a capital of $120,000,000, of which one-half is to be preferred stock with a 6 per cent. cumulative dividend, and the company are authorized to issue $75,000,000 of 4½ per cent. bonds.

There is a similarity in the amended charter of the company to that of the United States Steel Corporation. The amendments were adopted at a meeting of the directors of the original company held on September 17, and ratified subsequently by the stockholders.

By the amendments it was provided that the company should issue bonds, aggregating $75,000,000, and to be known as 4½ per cent. mortgage and collateral trust gold bonds. It was decided also that the existence of the company, instead of terminating on June 1, 1943, should be perpetual. Provision was made that the dividends on the common stock should not in any year exceed 10 per cent. so long as there should remain outstanding and unredeemed any of the bonds referred to. Another change in the original certificate is that the number of directors may from time to time be fixed by the by-laws, which shall prescribe what shall constitute a quorum.

The directors may hold their meetings outside of the State of New Jersey. Advantage is taken in the charter of an act of 1901, under which an action heretofore requiring the consent of at least two-thirds of the stock of the corporation may be taken by two-thirds in interests of the stock represented at any regular or duly called meeting. Provision is made that any officer may be removed at any time by an affirmative vote of the majority of the Board of Directors, and the directors have power to appoint officers other than those provided for in the original charter, among those mentioned being vice-presidents, assistant secretaries and assistant treasurers.

The International Navigation Company, of which the new company are an enlargement, were incorporated in June, 1893, with an authorized capital stock of $15,000,000, of which $9,205,000 in 8 per cent. noncumulative preferred stock was issued, $5,000,000 common stock and $13,000,000 first mortgage 5 per cent. bonds. Following are the names of the lines composing the consolidation:

White Star Line, with all its connections.
American Line to Southampton.
Red Star Line to Antwerp and Liverpool.
Leyland Line to Liverpool.
Atlantic Transport Line to London.
Dominion Line to Liverpool and London.

The new company have harmonious working arrangements with the Hamburg-American, North German Lloyd and Holland-American lines. The officers and directors of the International Mercantile Marine Company are as follows:

President, Clement A. Griscom.
Vice-President, Rt. Hon. W. J. Pirrie.

Directors: C. A. Griscom, P. A. B. Widener, B. N. Baker, John I. Waterbury, George W. Perkins, E. J. Berwind, James H. Hyde, Charles Steele, Rt. Hon. W. J. Pirrie, J. Bruce Ismay, Sir Clinton E. Dawkins, Henry Wilding, Charles F. Torrey.

Executive and Finance Committee: C. A. Griscom, P. A. B. Widener, George W. Perkins, Edward J. Berwind, Charles Steele.

British Committee: Sir Clinton E. Dawkins, chairman; Rt. Hon. W. J. Pirrie, J. Bruce Ismay, Henry Wilding, Charles F. Torrey.

Shipping authorities estimate that the consolidation has acquired the various lines forming it by payments to them as follows:

White Star and Dominion lines	*$70,400,000
American, Red Star and Atlantic Transport	*43,315,000
Leyland	*11,736,000
For working capital	*7,429,000
Syndicate profits	*27,500,000
Cash on hand†	9,620,000
Total	$170,000,000

This amount was divided as follows:

	Cash.	Preferred.	Common.
White Star and Dominion lines	$12,500,000	$38,400,000	$19,200,000
American, Red Star and Atlantic Transport	*15,844,000	*18,314,000	*9,157,000
Leyland	*11,736,000	.....	.....
For working capital	.....	*786,000	*6,643,000
Syndicate profits	.....	*2,500,000	*25,000,000
Cash on hand†	9,620,000	.....	.....
Totals	$50,000,000	$60,000,000	$60,000,000

* Official. † Available for new tonnage, ordered by White Star and Dominion lines; also for interest adjustments and working capital.

The rest of the preferred and common stock of the corporation and the collateral trust bonds are to be retained by the venders, who contribute, however, as working capital $786,000 in preferred stock and $6,643,000 in common stock. They are also to transfer to the syndicate for $50,000,000 in cash, $50,000,000 debentures and $2,500,000 of preferred stock and $25,000,000 common stock of the corporation.

Charles Steele of J. P. Morgan & Co. has denied that British directors would be in the majority in the new company's directorship, but said they might predominate in the subsidiary British companies. He said it was inaccurate to say that the Morgan lines would receive the same subventions as the Cunard Line, the fact being that in the matter of mail contracts the British Morgan lines are to receive the same treatment as the American lines.

The arrangement with the German lines is elaborate, comprising chiefly the yearly payment by them of their profit on an assumed capital of $5,000,000 to the syndicate and the syndicate agrees to pay the German companies 6 per cent. interest yearly on the same amount.

The Ceco Electrical Machinery.

The Christensen Engineering Company, Milwaukee, have just placed upon the market complete new lines of Ceco electrical machinery, including direct current motors and generators, alternators and transformers. For several years this company have been manufacturing electric motors for driving air compressors used in connection with their air brake equipments on electric cars. The company have also built a large number of motors of various capacities for driving air compressors used in general commercial service and all the motors for driving machine tools and shafting in their own works. In order to manufacture these motors the company have maintained an extensive equipment, particularly suited to the purpose. Some time ago it was decided to greatly increase their manufacturing facilities and to develop a complete line of electrical machinery. The company are now prepared to build machines up to 1500 kw. in capacity, suitable for general power, railway or lighting service.

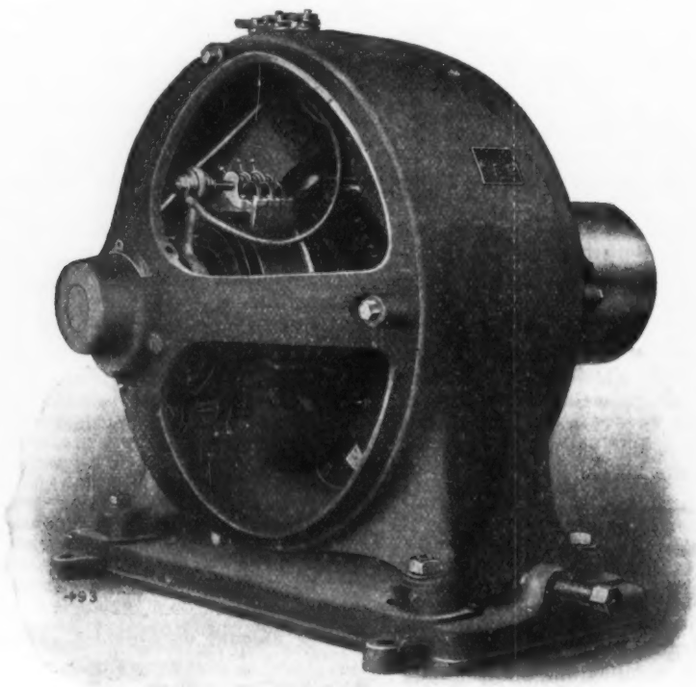


Fig. 1.—Motor.

THE CECO ELECTRICAL MACHINERY.

The line of Ceco motors known as Type C. E., ranging in capacity from 2 to 50 horse-power, is illustrated in Fig. 1. These motors are made in three styles, open, semi-inclosed and inclosed. The standard styles are belted, but any motor can be geared or direct connected to the driven machine or shaft.

The frame or magnet yoke to which the poles are secured is cylindrical in shape and is composed of a single steel casting. The bearing brackets are secured to the frame by bolts. The terminals are mounted on top of the frame, where they are not liable to be accidentally touched, but where they are readily accessible in case it is desired to change the connections in order to reverse the direction of the motor. The two bearings are supported by two end brackets which are identical and interchangeable, so that the motor is symmetrical and pleasing in appearance. The semi-inclosed style is the same as the open, but with the addition of four perforated malleable iron cover plates. The plates fit into the four open spaces between the arms of the end brackets and can be quickly and easily removed or replaced. The inclosed style is the same as the semi-inclosed except that the cover plates are solid instead of perforated. Either style of cover plates will fit into the open style motor, consequently the same motor may be used as open, semi-inclosed or inclosed.

The field poles are built of laminated sheet steel, thereby avoiding eddy current losses. The larger machines have four poles and the smaller sizes are built with two only, thus permitting the use of a commutator that can be insulated far more satisfactorily than is possible in small machines of the usual four-pole construction. The poles are bolted to the yoke, so that a rigid construction is obtained, and the pole is easily removable without disturbing the armature.

The field winding is composed of machine formed coils accurately wound by automatic machinery. Any field coil can be readily and quickly removed without disturbing the armature by simply withdrawing the pole as explained above. The armature core is built up of punched disks of soft sheet steel slotted around the periphery to receive the armature winding. These disks are reannealed and insulated after being punched, before assembling. The shape of the punching is such that when assembled on the steel shaft openings are provided for ventilation parallel to the shaft. Additional ventilation is secured by the use of radial air ducts.

The armature coils are all machine wound. Those for the smaller motors are of wire, while those for the larger sizes are composed of copper bars. The coils are all carefully insulated, then dipped into a bath of special insulating compound and finally placed in a drying oven until they are thoroughly baked. Surface bands are used to retain the coils in the slots on the smaller sizes, while the same result is secured in larger sizes by the use of retaining wedges placed in specially provided notches near the top of each slot.

As the core and poles are constructed of soft laminated steel, it is evident that the magnetic circuit, which consists of these three elements, is of the highest permeability and the efficiency of the motor is therefore correspondingly increased.

The commutator is built up of copper segments insulated from each other by sheets of mica of hardness corresponding to that of the copper, so that a smooth and even wearing surface is presented to the brushes. Pure hard drawn lake copper is used. The segments

are of generous length and depth, insuring cool running and allowing ample margin for wear. The commutator is easily removable from the armature shaft, tapped holes being provided in the face of the commutator sleeve for that purpose. As the commutator is usually the cause of more trouble than all other parts of a motor combined, unusual care has been given to the design and construction of this important element of Ceco motors.

Carbon brushes are used, and the brush holders are of the company's coil spring reaction type. They are very simple in design and absolutely reliable in operation. The brush holder studs to which the holders are secured are mounted upon a yoke, which is fastened to the inner side of the bearing bracket. Each brush can be readily adjusted and any brush can be quickly and easily removed while the motor is running. The brush contact area is in all cases ample for the current to be commutated, the current density being very low and at the same time consistent with economical design. Wear of the commutator is provided for by radial adjustment of the brush holder studs. After the brushes are properly set no shifting is required and the motor operates without noise and without sparking. The bearing surfaces are generous in area. Self aligning babbitted bearings with the well-known self oiling ring arrangements are provided.

The motors are mounted on a cast iron sub-base which is composed of a single casting, thus insuring true alignment. Belt tension is accomplished by moving the motor upon the sub-base in the usual manner.

The ventilation of the armature and commutator is remarkably good, thus insuring a low temperature while running continuously. The motors will operate at their rated loads without the temperature of the armatures rising more than 30 degrees C. The rise in temperature of the field coils under these conditions will not exceed 40 degrees C., and of the commutator 45 degrees C. These machines will operate from no load to full load with the brushes in a fixed position without sparking. They will also operate for two hours with 25 per cent. overload and for two or three minutes with 50 per cent. overload without injurious heating or sparking. These motors will operate in any position in which the shaft is horizontal. This is accomplished by shifting the bearing brackets on the frame so that the oil chambers remain in the proper position, whether the motor is secured to the floor, the ceiling or the side wall.

Ceco Alternators.

All the Ceco alternators, Fig. 2, whether belted, engine type or direct couple, are of the revolving field type, thus leaving the armature stationary and easily accessible. By this form of construction the difficulties of properly insulating the armature coils, which have caused much trouble in rotating armatures, are eliminated.

The frame consists of cast iron housings, into which rings of laminated steel with inwardly projecting teeth are assembled, thereby forming slots for receiving the armature windings. The armature is designed with six slots per pole, so that it may be wound or rewound for single, two or three phase as required. The armature frames for the belt driven alternators are cast in one piece, while the frames for the direct driven machines are driven horizontally. Instead of the usual practice of having several coils for the same machine all the armature coils for each of those alternators are of the same size and shape, so that they are interchangeable. The coils are specially insulated, so that they will stand without injury the highest temperature that will ever be reached in service.

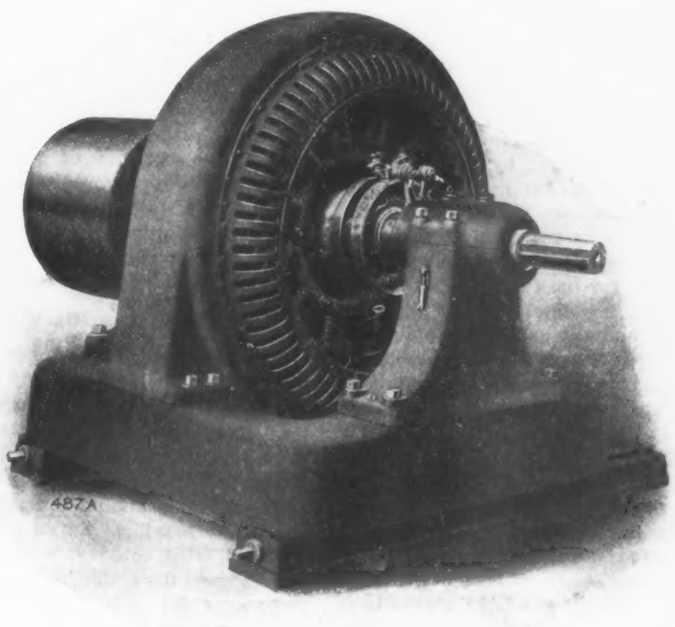


Fig. 2.—250-Kw. Three-Phase Alternator.

THE CECO ELECTRICAL MACHINERY.

The poles are built up of laminated steel upon a cast iron spider, which is mounted upon a forged steel shaft. In the large sizes the laminated poles are assembled upon a steel ring, which is carried on the shaft by means of the cast iron spider. The individual poles are in all cases easily removable with their coils without dismantling the machine. The field coils are composed of rectangular copper strap bent on edge. The collector rings are made of cast iron and carbon brushes are used, thus reducing to a minimum the tension required, as well as the wear of the parts. Standard frequencies are 60 and 25 cycles per second. With the exception of the smaller sizes these alternators can be wound for any voltage up to 15,000. The temperature rise when running continuously with full load at any power factor will not exceed 35 degrees C. in the armature or 40 degrees C. in the fields. At 25 per cent. current overload the corresponding temperatures will not exceed 40 degrees C. and 50 degrees C. The machines are all designed so that they will carry satisfactorily a 50 per cent. current overload for two hours at any power factor without injurious heating.

Notes from Great Britain.

British Railway Finance and Construction.

LONDON, September 27, 1902.—For some time there has been considerable disquietude evinced by railway shareholders as to the actual value of their property. This disquietude assumes two shapes: 1, The policy of British railway managers in charging to capital account expenditure on maintenance of way and structure and maintenance of equipment, and, 2, whether the present equipment of the British railways is not calculated to reduce revenue by relative inefficiency as compared with the railway systems in the countries which are our keenest competitors. The first point raises far reaching questions of railway policy and management and the second hinges upon what might be called the "big wagon" question.

In regard to this question of capital and maintenance an American correspondent of the London *Times* has been charging English railway managers with rank financial heresy in increasing their capital account and so *pro tanto* decreasing dividends. This American correspondent roundly asserts that the reason why American railways are so properous at the present moment and English railways the reverse is directly traceable to the persistent policy obtaining in this country of charging such large sums to capital account which should undoubtedly be debited year by year against revenue. He instances the Lackawanna Railroad and compares it with the North Eastern Railway Company of this country, in many respects regarded as the most efficiently managed British railway. It is evident that if the fiat is to go forth that for the future maintenance charges are to go against revenue there will be a marked disinclination to embark on new appliances and an equally strong disposition to become unreasonably conservative in making new purchases. But here enters a new factor in the problem—namely, whether original capital outlay in both America and England signifies the same thing.

George S. Gibb, the general manager of the North Eastern Railway Company, points out that in the expenditure last year of the Lackawanna such items were charged to revenue as renewals, improvements and additions of an unusual character, some of which were for new steel bridges to take the place of old ones which were light and unsafe for the company's present triffic. He goes on to say: "I do not want to say a single word against the successful and admirably managed Lackawanna, and perhaps its construction was on a superior level to that of other American railways. But it is notorious that in original construction the American plan was to build railways on the cheap, good enough perhaps to begin with, but not to last for long. Such work must be renewed soon and often. Curves are left to be straightened afterward, grades to be reduced, bridges to be rebuilt and so forth. The work on most high class English railways was of a different character—solid, costly, with immense reserves of strength, built almost for eternity and not requiring constant renewal." And he adds that all well managed English railways provide fully out of revenue for all necessary renewals.

On the question of maintenance and renewal of equipment Mr. Gibb points out that at December 31, 1900, the Lackawanna possessed 648 engines, the North Eastern 2121. Engines wear out more or less in the ratio of miles run. The same factor of miles run must be taken into account in judging of the expenditure on repairs. The Lackawanna train miles in 1901 were 18,212 per engine; the North Eastern train miles were 14,743 per engine, involving, therefore, assuming equal service in other respects, 23.5 per cent. more wear in the case of the Lackawanna. The heavier train loads on the American lines also, it is assumed, carry with them a larger annual expenditure for repairs per mile run and a shorter life per engine. Yet, notwithstanding this fact, the Lackawanna charged 16.9 per cent. of the gross revenue, while the North Eastern debit was 16.2 per cent. of the gross revenue. On betterment account the Lackawanna bought 79 new engines, at an average cost of $12,750 per engine, but had to break up or sell 72 worn out engines, so that the net result of it all was that they added seven engines to their stock, debiting nothing to capital. The North Eastern in the same year added 21 engines to their stock, at an average cost of $13,450, in addition to making provision for ordinary renewals, the old engines being replaced in all cases by new and more powerful engines, and all this without debiting capital with any part of the cost. It will be seen, therefore, in taking a cursory view of the question, that there is not so much difference between American and British railway practice as sensationmongers would have us infer. If this be so, then it follows that the English railway companies are suffering from some worse disease than bad finance, which, after all, makes the situation from the British point of view even worse than was feared. I may add before leaving finance that Mr. Gibb is frankly in favor of considering the present rather than the future shareholders. He says:

"If a shareholder owned £10,000 of stock in the assumed undertaking in 1870, yielding him an income of £600 per annum, why should he then consent to an immediate reduction of his income because he foresaw that 30 years afterward the holder of his £10,000 of stock would only be receiving £460 per annum? He would also foresee that the shrinkage in net profits would be due to the operation of general economic causes, and that these causes would operate on commercial and industrial undertakings all round, and also on prices, and that consequently an adjustment would to some extent take place in regard to the real value or purchasing power as well as the nominal figure of the income."

Big Wagons.

Reverting now to the more practical aspect of railway management, and one directly affecting the mineral trades both of this and other countries, it would appear that there is real willingness on the part of railway managers to introduce 20-ton wagons, but their good intentions are thwarted because an enormous proportion of the wagons running over English railroads are under private ownership. Seventy per cent. of the railway traffic of this country is mineral. A gentleman who understands the inside working of this question on this point says that it is carried on almost entirely in "private" wagons, which number upward of 500,000, or nearly half (45 per cent.) of all the wagons in the country. These wagons are owned by more than 4000 different proprietors, who are banded together in a solid phalanx by the Association of Private Owners of Railway Rolling Stock. A considerable number of these wagons are not owned by traders proper, but by proprietors (one railway carriage company own 6500), who maintain them and let them out on hire to coal merchants and other users, and who thus make large profits which ought legitimately to be made by railway companies. I have once or twice announced in these notes that large wagons have been placed either upon the Midland or the Great Western Railway service of this country. But in both cases these 30-ton wagons are for the private use of the railway companies themselves in transferring fuel. Until something is done to force the private owners to increase the capacity of their railway wagons it looks very much as if British railway practice in this regard must remain stagnant.

There is another aspect of the problem more nearly concerning American exporters. If later on it becomes necessary for Americans to market heavy mineral produce in this country it is of the first importance to secure the greatest economy of transit to its ultimate destination. On this point the *Shipping World* has something pertinent to say: "We do not expect immediately to see 30 or even 20 ton wagons in anything like general use, but we can see no reason why they should not be used practically for all the general shipping traffic. Our ports doing a general trade are not many in number, and it seems to us that if a wagon load rate were made it could not be abused; where there does not exist a traffic that could go in such quantities it simply would not go."

The Pig Iron Market.

American orders are now largely reduced to the one item pig iron, although, of course, different classes of pig are in request. Hematite is what most American buyers want and they cannot obtain enough to satisfy them. There is also a good demand for the better class of German foundry iron. A new feature during the past week or so has been heavy purchases of Welsh anthracite coal, which is taken over here as an indication that the coal strike in America is likely to continue. A large (rail?) order by the Canadian Pacific Railway Company has been given out, 20,000 tons to English firms and 25,000 tons to German makers. I have so repeatedly expressed my own opinion upon the present position of pig iron that for once I would like to quote from another writer in the Midlands, who says:

The pig iron situation in this country is almost as perplexing as that of copper, but with a difference. The statistical position of both metals is exceptionally strong, but while copper is unaccountably cheap, pig iron would seem to be disproportionately and unwarrantably dear. It is true that the public stocks of pig are rather low. They were under 200,000 tons on the 12th inst., or 18,000 tons less than at the beginning of the year; but they are not as low as in November, 1900, when the total stock was reduced to 126,000 tons. Moreover, we have 85 furnaces in blast in Scotland now, as compared with 81 a year ago, and the output is increasing. Yet prices are considerably higher than they were in November, 1900, and they are still rising. The United States demand, of course, is an important factor of the situation, but it is not big enough at present to account for the great discrepancy between prices and stocks, for although our total shipments this year show an increase of nearly 5 per cent. upon those for the same period last year, they are something like 40 per cent. under the corresponding total in 1900. America, indeed, has taken from us 183,000 tons more than last year, but this increase is nearly counterbalanced by a decline of 133,364 tons in our exports to Germany, Holland and Belgium. At the same time our imports of pig, mostly from Nova Scotia, Russia and Germany, have increased by 65,507 tons. Neither our stocks nor our exports of pig, therefore, furnish any obvious or adequate reason for the great advance in prices, which is so seriously handicapping our producers of wrought iron and steel, and it becomes difficult, if not impossible, to forecast the course of prices by the sole aid of statistics. The key to the enigma is probably to be found in the expansion of home consumption, as shown more particularly by the large recorded increases this year in our exports of railway material and manufactured iron and steel. These two items alone, indeed, account for an excess of 268,500 tons, and there is reason to believe that the home consumption of manufactured iron and steel has been at least equally progressive. It must be borne in mind, of course, that the benefits we derive from the trade boom in the United States are not to be measured solely by the extent of American demand, which has so far been insufficient to raise our exports to the 1900 level. The boom is benefiting us probably in yet greater measure by the practical disappearance of American competition from foreign and colonial markets, and there are no signs yet of any material revival of that formidable trade rivalry. In all probability, therefore, prices of pig, and consequently finished iron, will continue to rule high during the coming autumn, irrespective of American demand and stock statistics.

During the past week the market has been dull, most buyers holding over any contracts until after Quarter Day. Consumers of raw material are grumbling all along the line. The high price of fuel and of raw material generally, coupled with falling market prices in finished products, is squeezing them very badly, and we are in the way of having a clashing of interests between the ironmasters and the manufacturers of metal goods. This is not desirable, and will have ill effects. Prices remain very much as last week. Glasgow warrants are at 58 shillings 3 pence, a slight advance, but Middlesbrough pigs have gone down from 53 shillings 10 pence to 53 shillings 4 pence. I have heard one or two complaints by Americans that they have been compelled to pay a price slightly higher than the home market price. I believe this to be true. It is certainly true in regard to the purchasing of German material. My advice is: Buy through a British agent, and f.o.b. some English port.

"Americanizing" and British Dividends.

A number of interesting dividends have been announced this week. One or two of them show the influence of American practice and how British managers are looking to American practice to get them out of more than one tight corner. For example, the Sheepbridge Coal & Iron Company report a profit on last year's working of £77,462, and pay a dividend of 10 per cent. Sir Charles Maclaren, M.P., one of the directors of this company, remarked at the meeting that they had recently Americanized one of their furnaces with most satisfactory results. He remarked that they could not entirely Americanize their iron trade unless they could secure the co-operation of the workmen, and, what was still more important, Americanize the railway system. The Staveley Coal & Iron Company report a profit of £127,249, and a dividend of 10 per cent. Palmers Shipbuilding & Iron Company are another interesting announcement. Their profits for the year amounted to £89,924, and they pay a dividend of 5 per cent. on both preference and ordinary shares. They write off £50,000 for extensions, and carry forward £8244. Sir Charles B. Maclaren, the chairman, after some general remarks on the operations of the company, had something to say of interest to American readers. The demand for new tonnage had fallen off, and orders were not so numerous as they had been. They seemed to be on the eve of a depression, which many people believed would stay with them; the prices of ships had fallen 10 to 15 per cent., and there had been no alteration in wages; the workmen were receiving wages as high as they had ever been in the history of the shipbuilding industry. It behooved workmen as well as employers to consider what action should be taken if they were to maintain against the world their historic position as the great shipbuilding power. He advocated the adoption of the American method, saying that in Pittsburgh the amount of pig iron turned out per week per man was 15 tons against 5 in this country. Again, the American railways offered better facilities and made a greater endeavor to stimulate and develop trade than our English lines. In this country the antiquated superstitions of the railway companies strangled and choked their efforts to compete with foreign competition.

The Coltness Iron Company pay this year only 8 per cent. as compared with 15 last year, a falling off clearly indicating the trend of the market. Dick, Kerr & Co., whose operations are largely directed by American trained managers, report a profit for their last financial year of £103,758. They pay a dividend of 10 per cent., and a bonus of 20 per cent. on the ordinary share capital, and carry forward a balance of £30,868. Finally, I come to Armstrong, Whitworth & Co., whose net profit for the year amounted to no less than £786,607. The last five years' profits of this company—that is, since the great amalgamation—are so interesting that I herewith present them:

Year ended June 30—	Net trading profits.	Profits after payment of debenture interest.	Ordinary dividend. Per cent.
1902	£786,607	£723,252	15
1901	740,995	531,482	12½
1900	834,603	687,967	20
1899	835,964	690,448	20
1898	706,544	580,042	15

Armstrong, Whitworth & Co. are strong because they have such a variety of industries to handle. Last year they built an armor plate factory at Openshaw, upon which they spent £700,000. During the last five years about £1,000,000 has been devoted to betterment purposes. This does not cover all the money spent in this direction, for in the same period the combined share and loan capital has been increased by £1,532,423, while during the same time the sum of £1,753,334 has been spent upon additions made to capital account. There is thus £200,000 spent upon betterment, and evidently appropriated from revenue. S. G. H.

The Monell Process.—The Sharon Steel Company, Sharon, Pa., have bought from the Carnegie Steel Company the right to use the Monell direct process for the manufacture of open hearth steel. Work is being pushed by the Sharon Steel Company on the four additional open hearth furnaces which they are building, and these will be in operation before long.

Dispatches from Yokohama state that the Japanese Government will spend $10,000,000 yearly during the next six years building four battle ships, six first-class cruisers and several smaller vessels.

The New Westinghouse Foundry at Trafford City, Pa.

The remarkable growth of the affiliated Westinghouse industries was recently signalized by the creation of a new city and the building of another Westinghouse manufacturing plant. The new industrial center is located about 17 miles east of Pittsburgh on the Pennsylvania Railroad, and is to be known as Trafford City. Extensive factory sites have been laid out there to provide for the overflow of the several Westinghouse industries, a number of which have already used up all the available building room at their present locations and are still pressed for space. The first of the companies to erect buildings in the new city is the Westinghouse Foundry Company, who are at present putting up an extensive and model foundry plant and pattern shop described in this article.

In laying out this city provision has been made not only for the factories that are to be erected there, but also for homes and all modern improvements and comforts for the men who are to work in the factories. The latter will be located on a fairly level area between the Pennsylvania Railroad and the residence portion of the city, which will be reached from the railway station by a steel viaduct 1100 feet long. The residence district has been laid out upon hillsides and a generally level plateau, high enough above the factory sites to render it free from smoke and dirt. The city consists of two oblong areas, one of which is about ½ mile by 1-5 mile and the other ½ mile by 1-7 mile, the two areas meeting in such a way as to form a reversed letter "L," the corner of which is the most northerly part. The town has been laid off into about 800 building lots, each with an average frontage of about 30 feet and a depth of 100 feet. In addition to this, space has been left for six parks. The entire town has been provided with water works and sewerage systems, the latter including separate storm water and sanitary sewers. This work, as well as the paving of the streets, was completed before the city was thrown open to settlement. The latter event, which took place on June 7, 1902, recalled in many ways the famous booms of the far West. Many of the intending purchasers of the lots came to the site of the future city a day before the sale was to commence and squatted on the ground which they wished to possess.

The new town is connected with Pittsburgh by the Pennsylvania Railroad. In addition a street railway line has been built, connecting with the Pittsburgh Railways Company's line at Wilmerding, 2½ miles distant. This street railway passes over the steel viaduct into Trafford City and forms a loop through the principal streets.

The factory site, located in a bend of Turtle Creek, provides room for nine factory buildings, each about 200 x 800 feet. A system of railway yards and tracks serving this area has been laid out in a very thorough manner, providing a track alongside of each building and transversely through each end. The storage tracks, in connection with this, occupy an area of about 300 x 200 feet. This system of tracks is connected with the main line of the Pennsylvania Railroad by the Turtle Creek Valley branch of the latter. It is also to be connected with the towns of Wilmerding and East Pittsburgh, where the works of the Westinghouse Air Brake Company, the Westinghouse Electric & Mfg. Company and the Westinghouse Machine Company are located by an interworks railway, which will be operated by the Westinghouse interests.

The new foundry and pattern shop, which, as stated above, are at present being erected, are located at the extreme southern portion of the factory site and near the steel viaduct mentioned above. The pattern shop and storage building, which has already progressed well toward completion, is a steel and brick structure 605 feet long and 80 feet wide, with a hight to the eaves of the roof of 47 feet. The pattern shop occupies 160 feet at one end of this building. It is divided into two floors, the second floor being suspended from the roof trusses in order that the first story may be entirely free from columns, thus providing ample space for handling the largest patterns. The remaining 447 feet of the building is to be used for the storage of patterns, and has three floors, the two upper floors being supported on steel columns, and the entire space being divided by interior fire walls into three separate compartments. The foundations are of concrete, and the superstructure of steel and brick. The foundation of the ground floor is made up of 8 inches of concrete, into which the floor sleepers are bedded, and on top of these is a layer of 2-inch maple flooring. The upper floors in both the pattern shop and storage building are supported on steel beams and steel girders, and are made up of 3-inch yellow pine flooring covered by one thickness of maple flooring. The roof purlins are steel I-beams spaced 8 feet center to center, and covered with 3-inch roof sheeting, which is covered with slate.

The foundry building is 611 feet 8 inches long and 184 feet 3 inches wide outside of the brick walls, which are 36 feet high at the eaves and 80 feet at the peak. As in the case of the pattern shop the foundations are built of concrete and the superstructure of steel and brick. The foundry is divided transversely into three bays, the center bay being 80 feet 3 inches wide between centers of columns, runways being provided for traveling cranes of 80-foot span and 150 tons lifting capacity. The cranes will be electrically driven. The two side bays are each 50 feet 6 inches wide from center to center of columns, and are provided with runways for traveling cranes of 47 feet 2½ inches span and 50 tons lifting capacity. At one side of the foundry building runways are provided for yard traveling cranes of 100-foot span and a lifting capacity of 75 tons. The I-beams purlins are spaced 8 feet center and are covered with 3-inch yellow pine roof sheeting. The roof is covered with slate.

At the middle of one of the side bays, where the cupolas are located, is a charging floor about 50 feet square, constructed entirely of steel. The melting equipment of the foundry will consist of two air furnaces, each having a capacity of 30 tons, and three cupolas capable of melting 18 tons per hour each. This will enable a casting weighing as much as 100 tons to be easily poured, and the casting can afterward be lifted out of the sand by one of the 150-ton traveling cranes. The air furnaces will be employed for the largest and most important castings, owing to the fact that they yield a superior quality of iron, and the cupolas will be employed for the ordinary classes of castings, and particularly small castings.

The buildings will be heated by hot air, the foundry, pattern shop and pattern storage rooms to have minimum temperature of 50, 60 and 35 degrees F., respectively, in zero weather. Light will be furnished by both arc and incandescent lamps. In order to insure plenty of light during the day the windows are large and both the foundry building and pattern shop are provided with skylights of large area.

Cotton Manufacturers' Convention.—The New England Cotton Manufacturers' Association held their semi-annual meeting last week, in the building of the American Society of Engineers, New York, the sessions continuing from Tuesday to Thursday. The programme was very interesting, covering a large number of papers, addresses and discussions of commercial and technical interest. O. P. Austin, chief of the Bureau of Statistics, Treasury Department, presented a paper on our foreign commerce in cotton goods which attracted much attention. He pointed out that while the United States produces three-fourths of the raw cotton of the world it allows the countries of Europe, which produce no cotton, to in a very great degree supply the world's market with cotton manufactures. George C. Tewksbury of Boston described the underfeed system of mechanical stoking, with special reference to the history of its development. S. N. D. North, Chief Statistician, Division of Manufactures, United States Census, read a paper on the world's supply and consumption of cotton. The other papers were of immediate interest to cotton manufacturers.

Pacific Coast News.

SAN FRANCISCO, CAL., September 30, 1902.—I noted in my last communication the withdrawal of the Oregon Railroad & Navigation Company from the field of competition here, and now I have to chronicle another. The Pacific Steam Navigation Company have removed their steamers between here and Panama and left the field altogether to the Pacific Mail Steamship Company, who having settled with the Panama Railroad got back to nearly the same position that they occupied before the fight with the Panama road started. But there was still the "Kosmos" line, which carries merchandise from all North Pacific ports and San Francisco to those of Mexico, Central and South America. This has also been brought over to see the benefits of combination and although the steamers will continue to run as heretofore they will adopt the same schedule of rates as the Mail Company. There still remains the "Curacoa," which makes monthly trips to Guaymas and other Mexican ports, and here the rates have to be kept down. Every now and again, too, there is a steamer or sailing vessel which carries lumber, railroad ties or explosives to Mexican and Central American ports, and which is ready to fill up with hardware, groceries or machinery, and these vessels are becoming more numerous, and likely to be more so, as the introduction of steamers and steam schooners into the lumber trade in increasing numbers has left less for the old sailing vessels to do. The Pacific Steam Navigation Company withdrew their vessels for the reason, as they say, that those who encouraged them to put on their vessels, and who benefited by the consequent lower rates, failed to patronize them. There is in the aggregate a good deal of iron, steel, hardware and machinery shipped to Mexico and Central America, but the lower rates failed to start up much of a trade in these articles with the United States of Colombia, Ecuador, Peru or Chile. Occasionally some considerable consignments of machinery were sent to South American ports, but not often. We used to send a good deal of mining machinery for the use of the Peruvian mines, but that all seems to have fallen off of late. There have been few or no attempts of any consequence to work up a trade in hardware, iron or machinery with these South American countries from San Francisco. Circulars are gotten out in Spanish occasionally and sent to mercantile houses in these countries, and there the matter seems to begin and end.

Local trade is very good. Every house has all it can do and some have been adding to their warehouse capacity recently. The condition of the interior of the State has never been better financially, and people of all ranks and conditions, among farmers, &c., are buying freely of agricultural implements, building hardware, &c. On account of the good crops of the year there will be an especially good demand for agricultural implements, and the manufacturers at Benicia, San Leandro, Stockton, &c., will benefit accordingly.

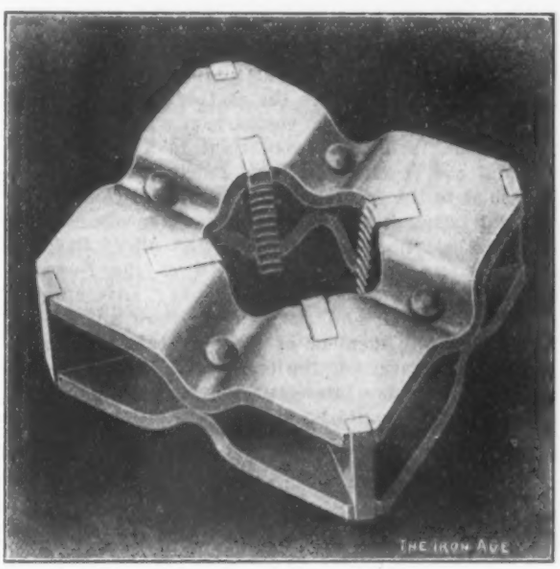
We have had heavy imports by rail during the past month, and there are heavy stocks of most of the leading descriptions of hardware, iron and steel. By sea the imports of pig iron have dropped off, but we have had large imports of machinery, the "Tremont" having 2102 packages. This vessel made a splendid record in her voyage from New York, making the trip in 54 days. The bulk of her cargo was made up of coal, iron, steel and the machinery aforesaid. There have been quite a number of vessels in from Europe, but they had nothing in this line. The Panama steamers had considerable consignments of pipe, wire, iron and steel.

The sinking of the individuality of the Union Iron Works shipbuilding business in that of the new combine has made very little difference here as yet. Everything appears to go on as usual. The principal interest of the public is as to how it will affect the local industry, of which San Francisco had grown to be proud, inasmuch as shipyard and all was the outcome of the pioneer foundry founded on the beach here away back in 1849. At present the Scotts are away and Manager Dodd of the machinery department takes Henry T. Scott's desk for the time being. The old secretary, Mr. Gunn, is still to be found at headquarters during business hours, but he has resigned and his place is occupied by Charles N. Champion.

The export trade continues to be good. Among the leading exports of the past two weeks were the following: Per "Doric," to China, typewriters, $1035; to Japan, bicycles, $9016; watch cases and movements, $7536; machinery, $5151; Korea, steel, $3662; then there was in hardware, principally to Korea, $1339. The "W. B. Flint," for various ports in Hawaii had steel, $3660, and railroad material valued at $3254. The "Ventura" had for Australia bicycles valued at $1582 and machinery valued at $4859; for New Zealand, machinery valued at $2833. The "City of Para" had machinery for Callao valued at $1280; for Mexico, valued at $15,732, and for Central America, $265.

The Economy Pipe Die.

The Economy pipe die, manufactured by F. E. Wells & Son of Greenfield, Mass., is made with four steel cutters, interlocked by two steel plates. These plates are shaped as shown in the engraving, and when the parts have been assembled they are held together under heavy



THE ECONOMY PIPE DIE.

pressure and riveted. This produces a light and extremely rigid structure. The advantages of this form of die are apparent. The hollow body provides ample clearance for the chips and oiling the cutters is made most convenient.

The West Virginia Coal Strike Settled.

Press dispatches from Wheeling dated October 5 state that settlements of the mine strike in the Kanawha Valley have been effected, that will mean the return to work of over 4000 men. The information was furnished in a telegram received by miners' officials from Vice-President T. A. Lewis of the United Mine Workers, who has been in the Kanawha field for several weeks negotiating the settlement.

According to the announcement 17 of the largest operators in the valley have made settlements with the respective forces, conceding them by far the best terms ever secured by miners in southern West Virginia. The diggers are given a nine-hour day with pay every two weeks. Each mine is to be allowed a check weighman, which was one of the points contested for, but the most important concession is the right to organize, a condition never precedent in that part of the State.

The mine workers' officials state that other favorable considerations were granted, but these will not be known until the agreements are drawn. The adjustment practically ends the strike in West Virginia. A rush of cars is said to have begun to the Kanawha field. Much coal awaits transportation, and the famine in many centers will be relieved immediately.

The Battle Ship "Louisiana" Bids.

Newport News Secures the Contract.

WASHINGTON, D. C., October 7, 1902.—The Judge Advocate General of the Navy on the 1st instant opened bids for the construction of the battle ship "Louisiana," the sister ship of the "Connecticut," the latter vessel having been selected for construction at a Government navy yard. Five competitors submitted bids, the lowest proposal being that of the Newport News Shipbuilding & Dry Dock Company of Newport News, Va., whose bids was $3,990,000, coupled with a promise to deliver the ship within 41 months from date of contract, and to this company the Secretary of the Navy on the 3d instant awarded the contract. The bids in detail were as follows:

Union Iron Works, San Francisco, Cal., $4,150,000, delivery within 42 months from date of contract.

William Cramp & Sons Ship Building Company, Philadelphia, Pa., $4,114,000, delivery within 42 months from date of contract.

Fore River Ship Building & Engine Company, Quincy, Mass., $4,087,000, delivery within 42 months from date of contract.

New York Ship Building Company, Camden, N. J., $4,040,000, delivery within 40 months from date of contract.

Newport News Ship Building & Dry Dock Company, Newport News, Va., $3,990,000, delivery within 41 months from date of contract.

For a variety of reasons much interest was felt by the officials of the Department in the outcome of the bidding. In the first place the cost of this vessel will be taken as the basis for a comparison with that of the "Connecticut," which is to be built in a Government yard, and the results will have much influence upon Congress as to the future policy with regard to the Governmental construction of war ships. In the second place the Department understands that all of the bidding companies, with the exception of the Newport News Shipbuilding & Dry Dock Company, have entered into a combination, and the officials were anxious to note whether any member of the syndicate would bid low enough to carry off the contract. The Bureau of Navigation was also interested in the question as to whether the ship would be built on the Atlantic or the Pacific Coast.

The bids as scheduled appeared to leave no doubt that the Newport News Shipbuilding & Dry Dock Company would be awarded the contract. This company not only offered the lowest bid, but the margin in their favor was $400 in excess of the 4 per cent. allowance which the law authorizes the Secretary of the Navy to make to a Pacific Coast contractor if it is deemed to be to the best interest of the Department. Another important consideration was the fact that the Newport News Company offered to deliver the vessel in 41 months, as compared with the offer of 42 months made by the Union Iron Works, which, with an allowance of 4 per cent., would be the next lowest bidder. The Department calculates that one month's gain in time is equivalent to $9000 in cash, an item which still further increased the margin in favor of the Newport News Company.

The company to which this contract has been awarded will be required to deliver the vessel equipped for sea, except that armor, ordnance, ordnance outfit and ship's stores will be furnished by the Government, and these specifications will be strictly enforced with a view to securing an accurate basis for determining the relative expense of construction in private and Government yards. The Department reserves the right to change within six months after the date of contract the number and caliber of guns, the arrangement of the battery and turrets or the thickness and distribution of the armor, provided that such a change shall not injuriously affect the stability or trim of the vessel nor involve an increase of total weights over and above those originally specified. Failure to complete the vessel within the time specified will involve penalties of $300 a day for the first month exceeding the expiration of the period fixed by the contract, and $600 a day thereafter until the vessel is completed and delivered. The specifications call for a speed at sea of 18 knots per hour for four consecutive hours, but if the speed falls below this limit and exceeds 17½ knots the vessel will be accepted, so far as speed is concerned, at a reduced price, the reduction being at the rate of $50,000 a quarter knot deficiency of speed from 18 to 17¾ knots, and at the rate of $100,000 a quarter knot deficiency of speed from 17¾ to 17½ knots. If the speed falls below 17½ knots the vessel will, at the discretion of the Secretary of the Navy, be rejected or accepted at a reduced price to be agreed upon by the Secretary and the contractor.

The general characteristics of the "Louisiana" were recently described in these dispatches in connection with the announcement of the opening of bids for material for her sister ship, the "Connecticut." A feature not heretofore referred to, however, will be an unusually well equipped work shop containing the following machine tools of approved design, which will be furnished and installed by the contractor, with proper line and countershafting (the former to be run by electric motor), and all necessary and usual spare parts and tools—viz.:

One screw cutting, back geared, extension gap lathe, to swing 28 inches over the upper ways and 48 inches over the lower ways, and to take between centers 8 feet closed and 16 feet extended.

One 14-inch screw cutting, back geared lathe, to have an 8-foot bed.

One column shaping machine of about 15 inches stroke and about 26 inches traverse.

One back geared vertical drill press, to drill up to 1½ inches in steel, 18 inches from edge of work, with at least 15 inches traverse of spindle.

One 16-inch sensitive drill.

One universal milling machine, with at least 20-inch table feed, 6-inch cross feed and 17-inch vertical feed.

One combined hand punch and shears, with 6-inch shear blades, capable of cutting ¾-inch round iron, shearing ⅜-inch steel plates, and punching ⅝-inch holes in ⅝-inch mild steel plates.

One emery grinder with two wheels 12 inches in diameter and 2-inch face.

One 30-inch grindstone.

Six bench vises.

The "Louisiana" is designed as a flagship, and the arrangement of quarters provides ample accommodations for the following complement: A flag officer, a commanding officer, a chief of staff, 19 wardroom officers, 10 junior officers, 10 warrant officers and not less than 761 men, including 60 marines. W. L. C.

The Vulcan Annealing Box and Compound.

The Vulcan annealing box made by the Ray Automatic Machine Company of Cleveland, Ohio, is of 18-gauge sheet steel and measures 18 x 10 x 10 inches. The Vulcan annealing putty has been used with the most stubborn steels, which have been brought to an easily workable condition without in any way injuring them. Self hardening steels can also be annealed so as to be readily filed or machined. As it is almost impossible to make a good job with the handicap of poorly annealed steel, and there is in connection with this the loss and breakage of valuable milling cutters as well as the increased wear and tear on lathe and planer tools, files, &c., there is here a chance of improving what is usually the blind end of the business, the steel and blacksmith combination, which is not invariably a happy one.

To use the material the putty is removed from the box until it is about half full. The steel is then heated to a good cherry red and placed as near the center of the box as possible, the putty is then thrown in until the box is full, afterward packing the material tightly together and covering with the lid. The steel is allowed to remain in the box until cold. The plan adopted in the annealing of Mushet steel is to pack a number of bars together so that they will make in all a bundle about 2 or 3 inches square. This is then heated and packed in the box, as in the other case.

Navy Estimates.—The Secretary of the Navy has presented his estimates for the fiscal year ending June 30, 1904. In round numbers the amount is $82,500,000, of which $26,000,000 is for the increase of the navy, as follows: For construction and machinery, $15,025,632; for armor and armament, $10,000,000; for equipment, $400,000; for two steel training ships, sailing vessels, $750,000, and for a wooden brig, a training ship, $50,000. Congress allowed $22,878,010 for the increase of the navy at its last session.

The Iron Age

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JOHN S. KING, - - - - - - - - - - BUSINESS MANAGER.

Cause and Cure of the Stringency.

The stringency in the New York money market was caused largely by heavy loans to stock brokers, for which the banks are not entirely without blame, and has been felt principally in the stock market, where rising rates for money and a curtailment of loans have checked speculation so violently that the Stock Exchange was on the point of a panic on Monday of last week. From August 16 to October 4 loans of the Clearing House banks were reduced nearly $57,000,000. But the stringency was not caused entirely by speculation, nor were its effects limited to speculators.

At this season there is always a very large demand for money from the West and South to pay for harvesting the crops and moving them from the farm. In Canada, where the banking system is such that the circulation rises and falls readily with the varying needs of business, the bank note circulation increases 15 to 20 per cent. from mid-winter to the end of October, after which it rapidly diminishes, as idle notes are returned to the issuing banks for redemption. Our bank circulation is not elastic; there is too little profit in putting out additional notes, and too much difficulty in getting them retired and stopping the tax on circulation when the notes can no longer be kept out. In the summer, banks from all over the country send their idle funds to New York, when money, therefore, becomes exceedingly easy and speculation is encouraged. As the fall approaches the Western and Southern banks recall their funds and there is a stringency in New York.

It is impossible for loans to be much curtailed and rates for money to advance without affecting general business. Rates of discount on good paper have advanced, and when the best names have to pay a little more for money names not quite so good have some difficulty in getting accommodated at quoted rates. As a result of the general prosperity collections have been very good, and there has been less occasion, relatively, for seeking accommodations from the banks. But a continuation of the conditions would have materially affected commercial business. A general fall of securities, especially when the best suffer the most, as on Monday of last week, when the best collaterals were sacrificed because the rates for loans touched 35 per cent., is certain to produce effects far beyond the limits of the speculative markets.

Some weeks ago it was estimated by a Chicago banker that the banks of that city would send into the country districts during the autumn $87,000,000. Last week it was reported that the banks of that city were sending to the West and Southwest $750,000 a day. Therefore they have recalled a good deal of their money from the New York banks. This season, up to October 2, close to $14,000,000 had been deposited in the New York Sub-Treasury for payment in New Orleans, Chicago and Cincinnati, but the funds shipped by express usually exceed those remitted through the Sub-Treasury. Between August 16 and October 4 the cash reserves of the Clearing House banks of New York were reduced more than $27,000,000. During this crop moving season there is annually withdrawn from the banks of the country a large sum of money, which remains for some weeks or months in the hands of grain and cotton buyers and the farmers; ultimately through purchases or deposits by the farmers this money gets back to the banks and through them reaches the financial centers, but in the meanwhile the resources of the banks are reduced, and the mercantile community finds money more or less tight everywhere. The enormous amount of money that has been drawn out of banks for circulation this season is shown by the statement that on September 14, the date of the latest reports of the national banks to the Comptroller of the Currency, the banks of 25 of the 33 reserve cities of the United States had less than the statutory amount of reserves.

In the meanwhile, under our independent Treasury system, used by no other important nation, the Government locks up the taxes it collects till it needs to disburse the money. In July the Treasury paid out more than it took in, but in August and September, when the necessities of the crop moving season were pressing, the Treasury collected $16,517,000 more than it disbursed, and most of the customs collections are made in New York.

To mitigate this contraction so far as possible it has long been customary for the Treasury to deposit some of the internal revenue collections—the law does not allow customs collections to be so treated—with national banks that will put up Government bonds as security, the amount so deposited having been for several months about $115,000,000, and now exceeding $127,000,000. It has also been customary, if the pressure for money became greater than usual, to prepay interest and to buy bonds offered at a price fixed by the Secretary.

In August Secretary Shaw invited the banks to meet the demand for more currency by taking out additional circulation on borrowed bonds, as they could not buy bonds for the purpose without loss, and he intimated that the Treasury would do nothing to relieve the situation. His plan led to very small results, partly because of the difficulty of borrowing bonds, and partly because banks were unwilling to take out additional circulation for the autmun on which they might have to pay tax a long time after the notes ceased to be needed. As the stringency increased the Secretary did what his predecessors have done, and more; in addition to increasing deposits with banks, and prepaying interest, and offering to buy bonds, at a price, however, which was not attractive, and the holders of bonds are seldom the parties pressed for money, he has offered to receive other securities than Government bonds as a pledge for deposits, and to relieve the banks of the obligation to hold a reserve against the Government deposits.

The latter he has a clear right to do. It is discretionary with him to take steps against a bank whose reserves are below the legal amount; what he has done is merely to notify banks that this will be permitted. Bank reserves have several times been below the legal limit; but no bank has been interfered with on that account if the low reserves were due to the financial situation. The Secretary's authority to accept other than Government bonds as security for Government deposits is not so clear; his predecessors have not felt authorized to do this, but he has undoubtedly taken good legal advice.

Symmetrical Appearance.

In the machine tool trade the days of ornamentation, *per se*, have gone by. No longer do we find a machine stuck up on fancy legs and beautifully decorated with scroll work in old gold. A lathe bed mounted upon sewing machine legs designed with a close regard to the line of beauty no longer provides good talking material for the salesman. Its persuasive powers have vanished. Even the locomotive, which used to be bound in dazzling strips of brass and to be fond of bright red paint and gilt stripes, is now as somber as a cleric in its garb. Any device or apparatus of metal that simply looks pretty is no longer the vogue—it has been relegated to things of the past and is of interest only to the student of antiques.

And yet at the present time more attention than ever before is being paid to the appearance of a machine, but the object sought by the designer is very different from what it used to be. He no longer attempts to attract the eye alone with a pleasing effect. His principal aim is to make the machine convey the impression, solely by its apppearance, that it is perfectly capable of performing the work for which it was designed. This idea obtains in the machine intended for accurate work and also in the massive construction adapted to the heaviest duty. But in neither case is ornamentation introduced. Both machines have a character, as revealed by the lines, distinct from each other in every respect. The first looks the refined tool it is; the second, by its proportions and disposition of metal, instantly conveys the impression that all stresses to which it may be subjected are adequately provided for and that it will perform the task set before it. No decoration whatever is in evidence, and, in fact, any endeavor along this line would probably result in the condemnation of the tool. It must stand upon its merits, naked and alone, and he who would try to adorn it would put store clothes on Apollo. The expressions "symmetrical appearance," "parts well proportioned," and so on are now common in descriptions of all sorts of tools.

In this strictly utilitarian age the useless is not in demand. The close competition of to-day prohibits the employment of anything which it costs money to produce and to maintain which yields no income except what may be derived from a nice appearance. Somebody must work in order to keep polished surfaces in good condition and somebody must pay the workman. If these polished surfaces serve no useful purpose then they eat but do not work and are therefore to be condemned. The consumer will not buy a machine upon which he must spend money uselessly. He wants an attractive machine, one with some individuality about it, one having a symmetrical appearance, but he balks at frills and furbelows.

Chicago's Building Record.

The figures recently made public respecting real estate deals and building operations in Chicago are interesting and of special significance as revealing the substantial improvement which has prevailed in that section not only during the last nine months but for several years, being a direct outcome of the prosperity of manufacturing interests. The figures referred to break the record for any three-quarters period in ten years, the total number of transfers of property for the first nine months of 1902 being 19,903, while the considerations aggregate $97,138,158, which is an increase of 2992 in the number of transfers and $12,688,219 in considerations over the corresponding nine months of 1901. While the transfers have been so much greater, the number of new structures erected up to October 1 of this year is only 47 more than during the corresponding period of last year, but the estimated cost is $11,399,820 in excess. This is the greatest value record since 1892, when there was extraordinary activity in building and real estate transfers because of the World's Fair; but the character of the buildings erected thus far in 1902 is vastly superior, all things considered, to the buildings erected in 1892. The average cost for this year was $8080, for last year $5743 and for 1892 only $4745.

The real estate transfers of record during the month of September aggregated 2244, with an estimated value of $9,047,109, which shows a substantial increase both over the preceding month and over the corresponding month last year. The report does not indicate the kind of property most in demand, but it is well known that the demand for sites for factories and warehouses and for central business properties has been one of the most conspicuous features in the Chicago real estate world, and as a result values have appreciated rapidly. Indeed, so sharp has been the advance that manufacturers contemplating improvements of the greatest importance have been unable to fulfill their desires. The property which has commanded the most attention is that which affords good shipping facilities either by rail or water. While there has been a marked appreciation in and around the city during the past few years, the rate of increase has varied greatly with the locality. In some sections there has been an increase varying from 15 to 50 per cent. This is especially applicable to the southwestern section of the city, where excellent rail shipping facilities are afforded, but dock property has also increased at a probable average of 15 per cent.

Very naturally the inevitable reaction following the overstimulation in 1892 discouraged investment in Chicago real estate, especially affecting investors who live in other parts of the country, but that a change for the better is imminent is evident. The present activity, however, is not of a speculative nature nor born of a desire to reap a benefit from appreciation in real estate, but rather is due to a desire on the part of manufacturers to secure advantageous positions for various industries or on the part of capitalists to secure property in the central portion of the city upon which to erect office buildings and afford greater facilities of all kinds for the rapidly growing business needs of the city. Those who have given much attention to the situation state that it is almost impossible to find an unoccupied foundry or warehouse in a desirable locality in the city at this time, and the demand is not as yet satisfied.

Considerable significance attaches to the fact that coal in large quantities has been purchased abroad for shipment to this country. Fifty thousand tons will be shipped immediately from England and an additional 100,000 tons have been secured. It is further probable that at least 100,000 tons will be received from Canada in the near future. But these sources cannot be relied upon for large quantities at definite periods. Mining operations would have to be increased to an abnormal degree in order to meet the home demand and at the same time relieve the situation here. Any interference or curtailment of the supply in England would result in stopping export.

John Pitcairn of Philadelphia, president of the Pittsburgh Plate Glass Company, at Pittsburgh, has returned from a two months' trip to Europe.

Lake Ore Matters.

Statistics of Shipments.

DULUTH, MINN., October 4, 1902.—Shipments from the whole lake region for the month have been about 3,700,000 tons, of which Minnesota has sent down 2,025,000 tons. This makes a total shipment for this year of nearly 21,000,000 tons, or more than all last year. Minnesota shipments for the month have been as follows:

	September, 1902.	September, 1901.	Season 1902 to date.	Season 1901 to date.
D. & I. R. R. R....	731,469	736,506	4,461,936	4,461,936
D., M. & N. R. R...	689,582	446,914	4,298,511	2,638,314
Gt. Nor. R. R.....	605,643	374,303	3,113,933	1,716,080
Totals.....	2,026,694	1,557,723	11,874,380	8,817,050

This is a decrease from August, as was to have been expected, as stock piles have been pretty well exhausted. It will be easy for the mines at work, even under comparative check, to send out 25,000,000 tons this season if they so desire.

The Minnesota Ranges.

Considerable will be done on Hunter's Island, on the international boundary, in the way of exploration the coming winter, and parties are now outfitting to operate there. The island is the geological continuation of the Vermillion range, and there are excellent showings and plenty of croppings all over it. It is a very large tract of land, containing many hundred thousand acres. Drilling is also to be carried on during the coming winter on the Atikokan range, north and west of Hunters Island and geologically similar to it. There will be more exploration on the Vermillion range in the vicinity of Ely and east than in some years. The Oliver Iron Mining Company are commencing with two drills in T 62 R 14, and two drills are working in T 63 R 12, close to Ely. The Silverman lands east of Ely are to be explored, it is claimed; perhaps by the Cleveland Cliffs Iron Company. Duluth parties are drilling in T 63 R 11, northeast of section 30, and several deals for exploratory options are pending in the same locality on the general strike of the main formation. It is also said that drilling will be carried on in the vicinity of Birch Lake, in T 60 ranges 12 and 13. This is on the easterly extension of the Mesaba range, in a district that has not been found at all fruitful of anything more than croppings.

A company are now being formed at Duluth for the taking of a tract of explored land in the Hibbing district that will start in under absolute guarantees, in the way of contracts, &c., that their ore will not cost them, mined and royalty paid, more than 55 to 60 cents a ton. The ore is of better than 60 per cent. iron and about half the deposit, which is comparatively small, is of a Bessemer grade. More than half the cost of getting out this ore will be in the royalty, so the actual cost of mining will be a pretty small thing, it will be seen. In a week or two full information can probably be given as to the items of cost and the personnel of the organization, which includes some very heavy interests, both in Duluth and Cleveland.

Both the Wills Mining Company recently mentioned and the Stephens mine of the Minnesota Iron Company will make small shipments this year. The Agnew mine of the harvester combination has already shipped 50,000 tons. The Letonia, a Sellwood property, is beginning shipment this or next week and will push forward as much ore as possible. It has a stripping of 30 feet, and this has been removed over a small area. At the Stevenson mine they mined and shipped in one day last week 16,250 tons of ore, four shovels being employed in the mining and with cars plenty. The mine has been pulling up very fast the past few weeks and will end the season ahead of the expectations of many. A third shaft is to be sunk at the Shenango mine of the Oliver-Snyder Steel Company, both the former attempts having been balked by the tremendous accumulations of water and quicksand. It has been thought better to sink new shafts the shallow depth required than to attempt the task of keeping the former open. In the bids for the removal of 250,000 cubic yards of stripping from the Hawkins mine there was a difference of nearly 25 cents per yard; in other words, the lowest bid was little more than half the highest.

An Important Western Mesaba Development.

About the most important piece of information for this week or some time previous is the statement that the Donora Mining Company (Union Steel Company) will abandon the Holman tract on the western Mesaba. This is especially important in that the most exhaustive exploration yet carried on anywhere west of Range 22 has been done there by the Donora Company, both in drill holes and in a shaft, and from the fact that the company could have bought the land, it is stated, on reasonable terms. The Holman lies in the southeastern quarter of the northeastern quarter of section 21 T 56 R 23, and joining the Diamond property of the Oliver Iron Mining company and near the Arcturus of the Hayward estate. The decision is important in the bearing it may have on western Mesaba explorations, in all that region toward the Mississippi where numerous more or less competent explorers are now working. A considerable tonnage of ore was found on the property, and extensive hand washing tests were inaugurated for the purpose of getting out the free and incrusted silica in the ore. These washing tests proved, generally speaking, that from 23 to 28 per cent. of the material washed went off as sand, which assayed anywhere from very little iron to 25 and 30 per cent.. The washed ore assayed from 45 to 58 per cent., the latter only occasionally and for comparatively thin bands. The shaft and drill holes all showed about the same character of ore, and changing at about the same depths, proving rather conclusively that the shaft was in an average of the formation, which seemed to be a flat basin. This shaft explained certain discrepancies of assay results that have troubled explorers on the west range for some time. It was found, for example, that the results of washed samples from the shaft were almost identical with diamond drill samples, except where the latter were taken with the greatest care and after saving all drill water and cuttings. In other words, the diamond drill samples from the sandy ore, characteristic of the western range, are ordinarily automatically washed. There was a difference of at least 10 per cent. in the results of samples taken with the greatest care under the direction of an experienced engineer and those taken by the hit and miss methods usual to many explorers and the former tallied with unwashed samples of the shaft. This is a matter of the greatest interest to exploration interests in the western range, and is diametrically opposed to experience along the central and eastern range.

The option on the Buckeye property, lying in section 36 T 56 R 25, between the Holman and the Mississippi, has also been abandoned.

Pickands, Mather & Co. are working five drills in proving the explorations on the Elizabeth mine at Hibbing, under option to the company from P. L. Kimberley and his Duluth associates. In all 11,600,000 tons were shown there by the original explorers.

Other Ranges.

The Cleveland Cliffs Iron Company have bought the lands of the Pendill Estate at Negaunee, and will explore the lands. This tract includes the old Lucy mine, a manganiferous ore deposit, and covers in all about 100 acres. The price paid was $85,000. Among the lands in Negaunee being explored by the Breitung Estate is the old Pioneer Iron Company tract, which the Cleveland Cliffs Company considered belonged to them and attempted to maintain by litigation. On this land it is stated that the Breitungs are finding ore and will have a mine. Two square miles of land about Negaunee is in the hands of this estate, and more than one mine is expected thereunder. A drill has been put in the old New York hematite location, and it is hoped that the ore once said to be found there will be rediscovered. At the Hartford mine building improvements are about complete and the machinery is coming along. Volunteer mine, now operated by the Donora Mining Company, will make an output this year of 110,000 tons.

Lands close to Iron River, Menominee range, have been optioned by Ishpeming men, and they will sink at

once. A shaft is now down 100 feet on the Kinney farm at Spring Valley, and some mixed ore is encountered. At the Columbia mine, now under the control of the Oliver Iron Mining Company, they are driving to find more ore, the old bodies having been about exhausted. It is supposed that somewhere on the location there is more good ore. The old Volunteer exploration, close to the Columbia, is unwatered and will be explored. This work is taken up on account of the fine showing made at the Tobin, whose ore body is supposed to enter the Volunteer land at depth. Tobin explorations are showing up a large property, and one that may prove very important.

The steamer "Hoyt" recently took on a cargo of 5002 gross tons of ore at Ashland in an hour and 30 minutes, of which 22 minutes were spent in shifting from one set of spouts to others, making the actual time ore was running into the boat only 68 minutes.

D. E. W.

The William Tod Company.

Comprehensive improvements which will double the capacity of the plant are being carried out by the William Tod Company of Youngstown, Ohio, the well-known builders of rolling mill engines and blowing engines. It was only last year that the company erected a new foundry. The first column was erected on July 6, and on August 14 the first half of the foundry was in use. This year the company have planned and are now putting up a new erecting shop, a new machine shop and a new forge shop. The erecting shop will be 75 x 200 feet, and will be 60 feet high to the crane rail, so that such machinery as the well-known Tod steeple compound blowing engines can be erected in it. This shop will be commanded by two 60-ton electric traveling cranes with a 10-ton auxiliary hoist built by the Browning Engineering Company, so that very heavy weights can be handled.

In a leanto 50 feet wide by 200 feet is to be installed a new machine shop commanded by a 10-ton crane built by the Youngstown Engineering Company. Some exceedingly large tools will be installed in this shop. Among these will be a 14 x 12 x 30 Pond planer and a Sellers floor boring and milling machine with 10-inch boring bar, probably the largest in the world. There will also be placed a 24-foot Niles boring mill, a 36-inch Ingersoll milling machine, a No. 9 Landis grinder, a 48-inch lathe, ordered from the Pittsburgh Machine Tool Company, a 26 and a 36 inch Lodge & Shipley lathe, a 62-inch and a 100-inch Bullard boring mill, a No. 4 Cincinnati milling machine and a No. 1 Bickford drill. All these tools will be operated by independent electric motors, the Bullock motor voltage system having been adopted.

The new forge shop will be equipped with a 2000-pound and an 800-pound Chambersburg hammer and a 5-ton Whiting crane. The forges will be operated on the Buffalo down draft system.

The structural material for the shops is on the ground, the buildings having been awarded to the American Bridge Company. It is probable that the company will be able to do some work in the new shops early in December.

The Sharon Steel Company's Furnaces.—The Sharon Steel Company, Sharon, Pa., have broken ground for a third blast furnace, to have a daily capacity of about 400 tons. Contracts for three pairs of blowing engines have been given to Mackintosh, Hemphill & Co., Pittsburgh, and they will be of 2000 horse-power each. The iron work for the furnaces was let to the Pennsylvania Engineering Works, New Castle, Pa., and the ore handling machinery to the Brown Hoisting Machinery Company of Cleveland, Ohio. The work of excavation has been started and the furnace is expected to be finished by July of next year. The Sharon Steel Company have one blast furnace in operation, another has been in course of erection for some time, and a third stack just started. These three furnaces will give the company a daily output of about 1200 tons of pig iron, all of which will be used in their open hearth steel plant, which now consists of eight 50-ton furnaces, but which is being enlarged by the addition of four more of the same size. The new blast furnace will be a duplicate of the other one now under construction, and will be 80 feet high and 19 feet in diameter at the bosh.

Australian Notes.

The board appointed to deal with the designs and tenders submitted recently for the Sydney Harbor Bridge have recommended the designs of the E. & C. Bridge Company of London, Sir Wm. Arroll & Co. of Glasgow and J. Stewart & Co. as most suitable. The board has, however, suggested that these three firms should submit amended tenders, and the date for receiving them has been fixed for January 27, 1903. Public opinion is divided regarding the necessity of the bridge, many people holding the opinion that if the money (say, at least a million sterling) were spent in some scheme of irrigation or water conservation it would be productive of greater good to the State.

The contract for the supply of steel rails and fish plates for the Victorian Railway Department has been secured by Jas. McEwan & Co., Limited, of Melbourne, it is reported, on behalf of the Lorain Steel Company of Ohio. Prices and quantities are as follows: 8500 tons of 80-pound rails, £6 2s. 6d. per ton, 7350 tons of 100-pound rails, £6 2s. 6d. per ton; 765 tons of fish plates, £8 2s. 6d. per ton; 740 tons of fish plates, £10 4s. 6d. per ton. Delivery as follows: One-fourth in six months, one-fourth in nine months and one-half in 12 months. Total value of contract is £113,634 19s. 2d. These prices show an advance over the last contract let at the rate of 5 pence per ton on the rails, and 8 shillings 11 pence to 9 shillings 10 pence per ton on fish plates.

The Riter-Conley Mfg. Company.

The Riter-Conley Mfg. Company of Pittsburgh, builders of iron and steel plate construction of all kinds, have received a contract from the Detroit Iron & Steel Company for the iron work for their new blast furnace to be built at Zug Island, Detroit, Mich. The stack will be equipped with a seal top device, the object of which is to retain most of the dust and gases. Such a device has just been added to the Soho Furnace of the Jones & Laughlin Steel Company, at Pittsburgh, by the Riter-Conley Company. This seal top device provides for an additional hood over the shell of the furnace. Into this hood the charge, carried up in cars on the automatic top filter, is dumped and the lower hood is charged before the charge is let down into the furnace. When this is done the upper hood is closed and the gas and dust are kept down. Under this system the only escape for dust and gas is when a slip or slight explosion occurs, in which case the explosion doors at the top let them out.

The Detroit Furnace will be 90 feet high and 20 feet in diameter at the bosh. The furnace plant will include four hot blast stoves.

The Riter-Conley Company are now working on a contract for the Choctaw, Oklahoma & Gulf Railroad to erect a number of steel water tanks along the main division of the road extending from Little Rock, Ark., to Amarillo, Texas, a distance of 624 miles. The tanks will displace the old wooden tanks which have been used and will be 24 feet in diameter and 30 feet high. They will be fed from artesian wells. The use of steel plate tanks for such purposes is expected to develop a new trade. The Choctaw road management adopted the scheme after the Riter-Conley Company met with success in building 55,000 barrel oil tanks in the Texas oil fields.

Correction.

An incorrect interpretation of the letters "G. M. B." was made in our Glasgow letter last week. These letters mean "good merchantable brands," and not "good mixed brands," as stated.

Annoying errors were also made in the reference to the four-page folder issued by the Henry L. Schwarzenburg Rail Company, 407 Cuyahoga Building, Cleveland, Ohio. The company's name was erroneously printed "Henry L. Schwarzenburg-Rath Company." In the last line of the notice "slice" should read "splice."

MANUFACTURING.

Iron and Steel.

The new plant of the Bettendorf Axle Company, Moline, Ill., is rapidly nearing completion in the eastern suburbs of Davenport, Ia., and it is expected that by November 1 all will be in readiness for the removal of the entire car-building plant to the company's new quarters. Several of the buildings have already been completed and the construction of those still unfinished is being rapidly pushed forward.

The Irondale Tin & Sheet Mill Company are being organized at Irondale, Ohio, for the purpose of erecting and operating a two-mill tin plate plant. The American Tin Plate Company took over the tin plate plant at Irondale formerly operated by Wallace Banfield & Co., but which has been removed to one of the other tin plate mills of the American Tin Plate Company. The citizens desire, however, to have a tin plate plant at Irondale and for that purpose are organizing the new company, and will utilize the building and part of the Banfield equipment. It will be some time, however, before the new plant is started, as none of the contracts have been placed.

The open hearth steel works and blooming mill of the La Belle Iron Works, at Steubenville, Ohio, have been completed and are now in operation. The company now have one of the most modern open hearth steel plants in the country.

Hubbard & Co. of Pittsburgh advise us that their business in various lines, including the manufacture of sheets, has so greatly increased as to encroach upon the department of their works set aside for the manufacture of shovels, and this has necessitated arrangements to enlarge the shovel department. The firm have recently bought more land adjoining their works, which will be used for this purpose.

The engineers of the Pennsylvania Steel Company are at work on the plans of the new open hearth steel plant of the Central Iron & Steel Company, Harrisburg, Pa., and the erection of the building will be commenced within a few months. It will be located along the river below the company's Paxton furnace, will be about 165 x 400 feet, and will contain 46 50-ton open hearth furnaces, which they expect will be producing in about one year. Tracks will connect the furnaces, open hearth department and rolling mills, and all modern conveniences for making the plant one of the most complete in Central Pennsylvania will be installed.

The Georgia Iron & Coal Company, Atlanta, Ga., who, as announced in these columns last week, are rehabilitating Rising Fawn Furnace preparatory to blowing her in early in the new year, are also extending operations at their coal mines, coke ovens, iron ore mines, and limestone quarry to provide ample supply of raw material for the furnace needs. Previous to 1900 they owned and worked extensive brown hematite and gray specular iron ore and manganese ore lands in Barton County, Ga. In that year they acquired under reorganization the properties of the Walker Iron & Coal Company, consisting of the Rising Fawn Furnace and about 9000 acres of coal and red fossilliferous hematite iron ore lands; the properties of the Castle Rock Coal Company, and the Dade Coal & Coke Company, consisting of 23,000 acres of coal lands; the properties of the Bartow Iron & Manganese Company, and the Iron Belt Railroad Mining Company, consisting of about 15,000 acres of brown hematite and gray specular iron ore and manganese ore lands. In the near future the company will open a branch office in Chattanooga, Tenn., from which point they can most conveniently direct the operations of their coal mines and coke ovens at Shellmound, Tenn., and blast furnace. The officers are Joel Hurt, president; Geo. F. Hurt, general manager; J. E. Fraser, secretary and treasurer; M. T. Singleton, mining engineer; John F. Glenn, purchasing agent, and J. I. Larimer, furnace superintendent.

Franklin Furnace and iron mines at Franklin Springs, N. Y., are said to have closed down last week on account of scarcity of fuel. They have plenty of orders on hand.

The Bassett-Presley Company of Cleveland, dealers in iron and steel, will erect a large warehouse at the corner of Knott and Elliott streets, that city. It will be 150 x 360 feet and two stories high. They will carry a full line of bar iron and steel.

We are officially advised by the Cambria Steel Company, Johnstown, Pa., that the report that they would erect a 200-foot addition to their byproduct coke ovens, to be used for two new blast furnaces, is untrue.

General Machinery.

The R. D. Nuttall Company of Pittsburgh, manufacturers of cut gears, are installing in their works a very large gear cutting machine, built by the Newton Machine Company of Philadelphia. This machine embraces some new ideas in gear cutting. The company would be pleased to have parties using large gears, mechanical engineers and others visit their works in Pittsburgh to see this large gear cutting machine in operation, which will be in the course of a week or two. The R. D. Nuttall Company are also installing an electric crane of 20 tons capacity.

The Jackson Drop Forging Company, of Cleveland, Ohio, have changed their name to the Cleveland Drop Forging Company, and have increased their capital to $25,000. Plans for increasing the capacity of the plant are being considered.

The Marion Machine, Foundry & Supply Company, Marion, Ind., have been incorporated with a capital of $25,000; directors, Chas. E. Chamberlain, Timothy J. Burns, Michael Egan, Henry L. Erlewine, Albert H. Loucks.

The Mt. Pulaski Wind Mill Company, Mt. Pulaski, Ill., have been organized with a capital stock of $10,000 to manufacture windmills and pumps. A. O. Vonderlieth, George Rupp and F. W. Obenmiller are the incorporators.

The Ransom Mfg. Company, Oshkosh, Wis., say that they are doing very little foreign trade but find the home market very lively. They have noted a considerable falling off in the Southern market in the last two or three months, but have a better trade in the Central and Western States, which more than makes up the difference. They are receiving quite a number of orders for their driven tool grinders from the larger concerns that are building new shops.

S. H. Wood & Co., Baraboo, Wis., have succeeded the Baraboo Iron Works, Roy Miner having sold his interest to S. H. Wood. The business will be carried on as heretofore, the firm doing general machinery repair work, castings, sleigh shoes, &c.

The Eaton, Cole & Burnham Company, Bridgeport, Conn., manufacturers of iron and brass goods, have let all contracts for the erection of their new machine shop, 42 x 202 feet, three stories, of mill construction. The building is to be occupied by the machinery and tool department.

The American Road Machine Company, Kennett Square, Pa., manufacturers of road and street working machinery, are now purchasing the machinery for their new shop, which with the equipment will cost about $20,000. The building will be 54 x 112 feet, of brick, two stories high.

The Cumberland Hydraulic Cement & Mfg. Company, Cumberland, Md., advise us that they are interested in a Portland cement plant to be erected in West Virginia at a point near Cumberland, but do not know yet what will be wanted in the way of machinery as it will be some time before plans will be in shape. The company had intended putting up a natural cement plant only, but they recently found that they can manufacture a first-class Portland cement on the property and will probably arrange the plant to make both grades. This will necessitate changing the original plans, which were well under way.

Charles A. Meeker, vice-president of the Standard Construction Company of Indiana, La Fayette, Ind., has purchased property for an electric plant at Horseshoe Bend, eight miles from Monticello, to furnish light and power to that place, Delphi and La Fayette.

J. Ramsey, Jr., president of the Wabash Railroad Company, has recommended to the Board of Directors the erection of new shops. Mr. Ramsey writes us: "No consideration has been given to the point at which they should be erected, and I doubt if they will be changed from the points where they are now located."

The Aetna Machine & Iron Works, Minneapolis, Minn., have incorporated for doing general machine work and for the manufacture of a patented automatic hoop sizing and fastening machine. They have recently taken out a patent on a new wire straightener which they will also make for the trade. The company have taken over a small shop whose business heretofore has been local. C. E. Cottrell, president and treasurer of the Minneapolis Cooperage Company, heads the new concern.

The Cincinnati Planer Company, Cincinnati, Ohio, continue to make extensive improvements to their plant and equipment. They are now installing a 150 horse-power boiler, a 50-kw. generator and a 25 horse-power motor, 14 and 18 inch Lodge & Shipley lathes, 36-inch Schumacher & Boye lathe, 48-inch Gould & Eberhardt automatic gear cutter, 16-inch Bridgeport automatic screw lathe, No. 3 Owen miller, 3 and 5 foot Fosdick radials, Higley cold saw and several of their own planers. They report a steady run of orders and predict a prosperous year for 1903.

The Industrial Iron Works, Omaha, Neb., founders and machinists, contemplate moving their plant to Sheridan, Wyo.

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., report the following orders: Illinois Car & Equipment Company, Hegewisch, Ill., two 250-kw. and one 200-kw. two-phase alternators, together with a four-panel switchboard and two 100 five, 75 and one 50 horse-power induction motors; Browning Engineering Company, Cleveland, Ohio, a large number of railway type crane motors, ranging in capacity from 25 to 50 horse-power; Steel Storage & Elevator Construction Company a direct current generator and a number of direct current motors for operating a large grain elevator which they are to erect for the Canadian Pacific Railway at Fort William, Ont.

Contracts for the improvements contemplated by the Otis Elevator Company of New York on a site at West Sixteenth and Laflin streets, Chicago, recently purchased for $50,000, have been let to a Cleveland construction firm. The first structure to be erected is a large foundry, which will cost $75,000, but a big warehouse and a machine shop are soon to follow. The company will expend in all about $150,000 in the enlargement of the plant.

The W. M. Pattison Supply Company of Cleveland, dealers in machine tools and supplies, are preparing to erect a warehouse 160 x 200 feet, three stories high, on property recently acquired on Hamilton, near Lawrence street, in the best part of

the manufacturing district of the city. The company make a specialty of mining machinery and owing to the anthracite strike they report that the demand for machinery from bituminous coal mines has increased greatly.

The W. S. Tyler Company of Cleveland have increased their capital stock from $500,000 to $1,000,000 in order to carry out a number of contemplated improvements. Although a number of improvements and extensions have been made within the past year the business of the company has increased so greatly that other extensions are necessary. The power plant is to be greatly increased and the number of looms multiplied. There is no change in the *personnel* of the officers.

The Strong, Carlisle & Hammond Company, Cleveland, machinery dealers, have rented two additional floors and an annex to the building they now occupy, about doubling their floor space.

The National Machinery Company of Tiffin, Ohio, state that the condition of trade during the last 30 days has been highly satisfactory. Orders of considerable size have been steadily coming in, and to enable themselves to satisfy customers and to live up to deliveries they have lately doubled their capacity by the addition of new machinery, and are in much better shape than ever to get out orders quickly. From the inquries that are being received from every quarter (to say nothing of the orders) the company think the outlook for the winter and spring very promising, and are confident that they will have all the business that they can handle.

Boilers, Engines, &c.

The Heine Safety Boiler Company, St. Louis, Mo., have increased their capital stock from $100,000 to $430,000.

The Light Inspection Car Company, Hagerstown, Md., have purchased a large brick building on West Washington street near the station for the purpose of increasing their capacity. Machinery will be put in for the manufacture of gasoline engines.

On Wednesday, October 15, the annual election of the directors of the Consumers' Light, Heat & Power Company, Johnstown, Pa., will take place. It is expected that at that time the site for their plant will be decided upon.

Pittsburgh Gage & Supply Company have secured the contract for two 250 horse-power boilers for the new bread and cracker bakery which the Ward-Mackey Company are now erecting at Pittsburgh. The company are installing a complete White Star filtering system in the power house of the New York & Stamford Street Railway Company, Port Chester, N. Y.

The American Brake Shoe & Foundry Company, 170 Broadway, New York, are in the market for a new 100 horse-power automatic engine, moderate speed. *See Foundries.*

Generators, engines, &c., will shortly be purchased by the City Gas & Electric Company, Murfreesboro, Tenn. They have had plans prepared for improvements to their plant which will cost about $15,000.

Charles T. Lehman, Birmingham, Ala., dealer in new and second-hand machinery, will erect a new storehouse with double the floor space of the present one. Mr. Lehman has recently sold a large number of hoisting engines and boilers, aggregating 1400 horse-power.

The patents of the Shaffer Machine & Mfg. Company, including Shaffer's coal oil burner, steam boiler, engine and metallic piston packing, have been acquired by the Shaffer Boiler & Engine Mfg. Company, 327 North Calvert street, Baltimore, Md., recently incorporated with a capital stock of $200,000. The new company are installing a small plant and will at first pay all attention to putting on the market the oil burner, which they claim can be satisfactorily used in steam and hot water boilers, furnaces and ranges. Later they will put the engines and boilers on the market, and intend eventually to go into the manufacture of automobiles. The officers are Adrian Posey, president; D. H. Hargett, vice-president; A. H. Callou, secretary; H. S. Roop, treasurer and general manager; R. M. Shaffer, superintendent, and E. O. Grimes, Jr., general counsel. These with W. T. Wilson and A. B. Graver constitute the Board of Directors.

The W. S. Tyler Company, Cleveland, Ohio, will extend their power plant. *See General Machinery.*

Bishop & Babcock of Cleveland, manufacturers of tanks, pumps, faucets, &c., have completed plans for the erection of a large brick power house adjoining their present plant on Hamilton near Kirtland street. They propose to operate nearly all of their machinery by electricity.

The Zanesville Chemical Engine Company of Zanesville, Ohio, have been incorporated under the laws of West Virginia. They will establish a plant at Zanesville for the manufacture of chemical engines. Their capital stock is $250,000.

J. N. Hutchinson, secretary of the Water Works Commission, Lima, Ohio, advises us that as soon as the $150,000 bonds, which have been authorized, shall have been sold, bids will be asked for two centrifugal pumps of 10,000,000 gallons capacity per day, about 500 or 600 horse-power of boilers and engines, and about one mile of 30-inch pipe for extending the water works. Blanks and specifications will be ready probably by the middle of November.

Foundries.

Butts & Slack, Medina, N. Y., manufacturers of soil pipe and fittings and plumbers' supplies, incorporated as the Medina Foundry Company some months ago, are erecting a new plant which they expect to have in operation by January. There will be a foundry, 80 x 150 feet; machine shop, 35 x 50 feet; rattling room, 25 x 50 feet; warehouse, 50 x 100 feet; pattern room, 30 x 40 feet; blacking room, 25 x 30 feet, and a large office. All required machinery has been purchased, the principal item being six induction motors, which were furnished by the General Electric Company. The officers are Michael Slack, president; Orren F. Butts, vice-president and general manager, and B. Edward Slack, secretary and treasurer.

The American Brake Shoe & Foundry Company, 170 Broadway, New York, advise us that they are in the market for a new 100 horse-power automatic engine, moderate speed, together with foundry equipment for their new plant, to replace the one at Chattanooga, Tenn., which was recently destroyed by fire. Rebuilding will commence at once and the new foundry will have a capacity of 35 to 40 tons per day at the start. It will be arranged so that new extensions can be made at any time without changing the general layout.

The recently organized New Castle Foundry Company, New Castle, Ind., are erecting a new foundry plant, the main building of which will be 60 x 120 feet, of brick with slate roof. The company at first will manufacture only gray iron castings, but later they intend to make cast iron pulleys and steel ranges. Geo. W. Pitman, secretary of the Safety Shredder Company, is interested.

The Union Steel Casting Company of Pittsburgh have re-elected the old officers, as follows: C. C. Smith, president; Samuel H. Church, vice-president: G. W. Smith, secretary, and G. W. Eisenbeis, treasurer.

The Dimmick Pipe Company, Birmingham, Ala., state that they are now, as they have been since commencing business in August, 1900, quite full of orders, having contracts from almost every State in the Union. They have also contract for pipe from the city of Vera Cruz, Mexico.

The Zanesville Malleable Iron Company have commenced operations in their new plant at Fair Oaks, near Zanesville, Ohio. The building is L shaped and contains a foundry 120 x 200 feet, engine and machine shop 80 x 110 feet, annealing room 80 x 106 feet and office 30 x 50 feet. They will produce air furnace malleable castings. R. H. Frees is president, J. D. Brennan vice-president and general manager and S. H. England secretary and treasurer of the company.

The Champion Steel Range Company of Cleveland find themselves so pressed with business that they have decided to more than double their facilities by the erection of a large foundry and factory. The location has not yet been decided upon.

The Novelty Iron Company of Canton, Ohio, have completed their new foundry building to take the place of the old one destroyed by fire last winter. The new foundry is built of vitrified brick and steel and has two cupolas with a melting capacity of 35 tons daily. Both the core and foundry departments are covered by 20-ton electric traveling cranes. The new addition will give employment to about 200 men.

Bridges and Buildings.

The Riverside Bridge Company of Wheeling, W. Va., have purchased the plant of the Riverside Bridge & Machine Works at that place.

The Union Machine & Boiler Company, formerly the River Machine & Boiler Company of Cleveland, have taken up the production of structural iron work and have added a department for this class of work.

Fires.

The machine shop of the People's Gas Light & Coke Company, Chicago, Ill., was damaged $35,000 by fire last week.

Hardware.

United States Wire Mat Company, Decatur Ill., report business in their line as entirely satisfactory, showing an increase of nearly 300 per cent. as compared with a year since. The company's manufacturing facilities have been increased by the installation of new and improved machinery, thereby enabling them to keep up with the increased demand and fill orders promptly.

The capital stock of the Lansing Wheelbarrow Company, Lansing, Mich., has been increased from $250,000 to $415,000.

The Screen Door & Window Company, Limited, Owosso, Mich., have recently been organized. They will manufacture a line of screen doors and windows.

Pottsville Bolt Company, Pottsville, Pa., are very busy and contemplate enlarging their plant next spring to meet the increase in trade.

Guilford Wheel & Mfg. Company, Guilford, Conn., manufacturers of wheels and heavy wagons, advise us that business with them has doubled during the past year, and they are about to enlarge their plant to put them in a position to take care of their new customers.

The Horton Mfg. Company, Bristol, Conn., makers of steel fishing rods and mountings, will build an addition to the machine, guide and tip departments, and a smaller building for storage of patterns.

J. E. Rhoads & Sons, 239 Market street, Philadelphia, Pa., are building, at Wilmington, Del., on the line of the Baltimore & Ohio Railroad, a brick factory 60 x 160 feet, three stories high, and an engine house and a tannery in addition. The buildings will be of very substantial, slow burning construction, and will be arranged and equipped with up-to-date machinery and appliances to secure the greatest convenience and economy in the manufacture of leather belting.

The Colton Mfg. Company, manufacturers of saddlery hardware, Montpelier, Vt., have in mind the erection of a substantial brass foundry plant, and are intending to experiment with a new device for melting with oil instead of coal. They expect to double their present foundry output, and where they now work 12 molders, to give employment to 25. The company refer to these improvements as necessary owing to the material increase in the demand for their goods during the past year.

The Ornamental Iron & Wire Company of Chattanooga, Tenn., have recently put in machinery for making about 50 different styles of ornamental wire fences; also other machinery for making a general line of field wire fencing. Their new No. 9 catalogue illustrates some of their most popular designs of ornamental wire fencing. They are having a widespread demand for their ornamental fences and are prepared to fill orders with promptness. Besides an extensive line of wire fencing the company also make all kinds of plain and ornamental iron fencing for residences, cemetery inclosures, churches, court houses, parks, &c. Their No. 8 catalogue, showing a number of their standard styles and prices of iron fencing, will be sent free on application. This company were reorganized only a few years ago, since which time the new management has thoroughly overhauled the business and put in a large amount of new machinery. Besides the two specialties above mentioned their products include a general line of builders' iron and steel work, as well as all kinds of ornamental iron, wire, brass and nickel plated work.

Simeon L. & Geo. H. Rogers Company, manufacturers of sterling silver and silver plated ware, Hartford, Conn., are rushed with orders and the factory is now running 13 hours per day.

McKinnon Dash Company, Buffalo, N. Y., have materially increased their capacity for the manufacture of leather dashes and fenders. At Buffalo they have made a very large increase in their electric welding plant. At their Troy, Ohio, plant they have installed a complete electric welding plant. They have also increased the power and added new machinery in several departments at both places. They now have at Buffalo a 100 horse-power induction motor, which drives direct current generators to supply all of the smaller motors scattered throughout their factory, and a 150 horse-power induction motor, which drives a dynamo producing alternating current for the welding machines. At Troy they have just placed a new 400 horse-power Corliss engine, which drives a 150 horse-power dynamo for electric welding, and a similar direct current dynamo for power and light. There are also scattered through the factory for distribution of the power some 20 direct current motors. These additional facilities, together with supplementary special machinery, have greatly increased their capacity for manufacturing dashes and fenders. Their Canadian factory is at St. Catharines, Ont.

Tucker & Dorsey Mfg. Company, Indianapolis, Ind., are rebuilding their factory so as to double its former capacity and increase their facilities fourfold. They are putting in new boilers, engine, heating plant, automatic sprinklers, electric lighting, sanitary facilities and all modern conveniences. They are installing many new machines, such as special wire machines, nailing machines, automatic lathes, &c. These improvements will be followed by the erection of a gray iron foundry, and in future the company intend largely making their own supplies of all descriptions.

Miscellaneous.

The Bay Shore Electric Company, Norfolk, Va., will double-track their entire line and make some improvements to the power plant.

The Milner Coal & Railroad Company, Birmingham, Ala., will spend $175,000 in improvements at their New Castle properties, including the building of 200 additional coke ovens and new houses and increase of output of all three mines. The coke from these ovens will be sent to the Woodstock Iron Works, Anniston. All material has been purchased, the fire brick from the Nelson Fire Brick Company, Ashby, and the rail and engines from the Birmingham Rail & Locomotive Company.

The Union Brass Works, 7 Sherman street, Boston, Mass., brass founders and finishers, have incorporated with a capital stock of $100,000. The company will make a specialty of the manufacture of the Soderlund twin faucets and fixtures used in connection with the same. Their plant is amply equipped for present requirements. Gustavus A. Soderlund is president and Charles E. Bowers treasurer.

The Lincoln Stove & Range Company of Fremont, Ohio, have been incorporated with a capital of $100,000.

The property recently bought at Roanoke, Va., by the Norfolk & Western Railway Company is simply for an extension to their yards at that place. The company's plan is to provide a receiving yard as an adjunct to their present yard facilities. No other change is contemplated at present.

T. A. MacKimm, first vice-president of the Boston & Maine Railroad Company, advises us that the company have no intention of building car or other shops at Beverly, Mass., where, it was reported, their shops were to be removed from Salem.

The Ohio Galvanizing & Mfg. Company of Niles, Ohio, are building a 50 x 150 foot addition to their plant.

The Mitchell Wheel Company have been incorporated at Miamisburg, Ohio, with a capital of $100,000.

The Columbia Plate Glass Company of Pittsburgh have completed their new plate glass plant at West Blairsville, Pa., on the Conemaugh River. Samuel C. Grier of Allegheny is president and John M. Conroy of Conroy, Prugh & Co. is secretary.

The Fournier-Searchmont Automobile Company assumed absolute possession of their newly acquired property at Trainor's, Pa., on Oct. 4. The company have vacated their former factory at 1230 Orkney street, Philadelphia, and the machinery has been shipped to the new plant. In addition to that which has been in use at the Philadelphia factory, the company have purchased $75,000 worth of new and latest improved machinery necessary for the manufacture of automobiles. When all of the improvements have been fully completed the company expect to have one of the finest and best equipped automobile factories in the world.

The Buffalo & Susquehanna Iron Company of Buffalo, N. Y., have contracted with William B. Scaife & Sons Company of Pittsburgh for a 6000 horse-power We-Fu-Go water softening and purifying system. This is the third plant purchased by the same parties, the first and second being located at other points. William B. Scaife & Sons Company are receiving large contracts for both the Scaife and We-Fu-Go water softening and purifying systems, of which they are the sole manufacturers. They have now in successful operation over 200,000 horse-power in the United States alone, handling over 25,000,000 gallons of water daily, principally for boiler use, although a part of this amount is used in almost every industry in which soft water is desirable. Among some of their other recent sales are the following: Pennsylvania Salt Mfg. Company, Wyandotte, Mich., 1750 horse-power; Hecla Portland Cement & Coal Company, North Bay City, Mich., 1500 horse-power; Hecla Portland Cement & Coal Company, West Branch, Mich., 500 horse-power; Toledo Furnace Company, Toledo, Ohio, 3750 horse-power; National Mining Company, Sygan, Pa., 1000 horse-power; Pittsburgh Plate Glass Company, Elwood, Mich., 2500 horse-power; Lancaster Mills, Clinton, Mass., 1,000,000 gallons.

H. A. Crawford, J. F. Bennett and a syndicate of carriage men of Flint, Mich., have taken over the plant of the Lull & Skinner Company at Kalamazoo, and have reorganized the company with a capital stock of $250,000. The plant will be enlarged by at least one additional building and probably more. Tabor S. Skinner is to retire, but L. C. Lull is to continue as one of the managing directors.

The J. G. Brill Company, Philadelphia, will operate their recently acquired plant in St. Louis, Mo., under the name of the St. Louis Car & Truck Company, recently incorporated with a capital stock of $1,000,000.

The North Electric Company of Cleveland, manufacturers of telephones and supplies, are now occupying the Grand Arcade Building, that city, which has been remodeled for their work. It gives them about four times their former facilities and they will install considerable machinery to increase their output.

The Cleveland Car Company, manufacturers of mining cars, at Cleveland, have commenced work on a large plant on the Lake Shore & Michigan Southern Railway, near Rockport, just outside of Cleveland. An effort will be made to complete the plant before the first of the year.

The Goodall Worsted Company, Sanford, Me., are having plans prepared for a new machine shop. All contracts have been closed.

The Atlas Car & Mfg. Company of Cleveland, manufacturers of mining cars and industrial equipments, are erecting a large addition to their plant, consisting of two structures, 100 x 250 feet. They will be equipped with electric cranes and other improvements. They are building an industrial equipment for a new steel plant in Pennsylvania, and a number of mining cars for mines in Washington and Montana.

Capitalists at Youngstown, Ohio, are organizing a company to make rolled iron trolley poles, and have secured a site near the works of the Youngstown Iron Sheet & Tube Company. It is expected that building of the new plant will be started in a short time.

The United States Steel Tie Company of Pittsburgh have been granted a charter with a nominal capital of $1000. They intend to build a plant in the Pittsburgh district for the manufacture of steel ties.

The American Spiral Spring Company of Pittsburgh contemplate changing from a private partnership to a corporate company.

R. Wallut & Co., 168 Boulevard de la Villette, Paris, France, recently placed an order with the McCormick Division of the International Harvester Company for 16,021 machines. This order includes mowers, binders, reapers and sulky rakes, and is conceded to be the largest ever placed for harvesting machines. While the McCormick line is the heaviest which they carry, R. Wallut & Co. also import and sell other American agricultural implements, such as plows manufactured by Bucher & Gibbs Plow Company, Canton, Ohio; hay loaders from the Deere & Mansur Company, Moline, Ill., and many other lines. R. Wallut, senior member of the firm, who is now visiting this country, will also investigate seeding machines with a view to making them a part of the European trade.

The Columbus Buggy Company, Columbus, Ohio, have commenced the manufacture of electric automobiles and made the first shipment of machines last week. The first sample completed was shipped to Detroit to be exhibited at the annual convention of carriage and vehicle manufacturers.

Pig Iron Production Stationary.

Not much change is to be noted this month. Furnaces are still having great difficulty in securing a satisfactory supply of coke.

The weekly capacity of the furnaces in blast on October 1 compares as follows with that of the preceding periods:

	Total capacity per week. Gross tons.	Coke capacity per week.	Charcoal capacity per week.
October 1, 1902	344,040	336,829	7,211
September 1	335,189	328,243	6,946
August 1	336,465	328,745	7,720
July 1	350,890	343,250	7,640
June 1	344,748	337,492	7,256
May 1	352,064	337,627	6,437
April 1	337,424	331,140	6,284
March 1	323,028	316,039	6,989
February 1	332,045	325,440	6,605
January 1	298,460	291,992	6,468
December 1, 1901	324,761	317,358	7,403
November 1	320,824	313,775	7,049
October 1	307,982	300,538	7,444
September 1	299,861	293,256	6,605
August 1	303,847	297,269	6,578
July 1	310,950	303,793	7,157
June 1	314,505	306,991	7,514
May 1	301,125	293,915	7,210
April 1	296,676	288,766	7,910
March 1	292,899	284,825	8,074
February 1	278,258	278,258	8,335
January 1	250,351	243,254	7,097
December 1, 1900	228,846	222,067	6,779
November 1	215,304	207,381	7,923
October 1	223,169	214,921	8,248
September 1	231,778	223,551	8,227
August 1	244,426	236,131	8,295
July 1	283,413	274,921	8,492
June 1	296,376	288,771	7,605
May 1	293,850	286,956	6,894
April 1	289,482	281,644	7,838

The production of pig iron is being maintained close to the mark of the past two months.

Production of Pig Iron—Gross Tons.

	First six months, 1902.	July, 1902.	August, 1902.	September, 1902.
New York	169,890	32,816	34,450	28,053
New Jersey	105,295	12,880	15,032	10,617
Schuylkill Valley	239,493	45,329	39,208	34,417
Lehigh Valley	282,276	38,972	38,980	34,224
Susquehanna and Lebanon	321,495	49,362	47,332	41,371
Pittsburgh District	2,094,274	356,777	355,524	348,362
Shenango Valley	606,478	101,823	104,903	118,827
Western Pennsylvania	497,431	90,618	88,943	85,152
Maryland, Virginia and Kentucky	461,215	75,770	75,499	80,337
Wheeling District	359,136	69,649	74,436	71,897
Central and Northern Ohio	556,761	105,463	114,108	107,522
Mahoning Valley	764,571	116,175	112,302	105,482
Hanging Rock and Hocking Valley	183,239	23,677	27,185	21,668
Illinois, Wisconsin, Minnesota, Missouri and Colorado	1,114,793	200,599	190,989	181,830
Alabama	677,199	90,562	120,370	118,669
Tennessee	186,067	31,386	29,004	30,172
	8,619,613	1,441,858	1,468,165	1,418,600
Charcoal pig	186,098	34,038	30,677	28,834
Totals	8,805,711	1,475,896	1,498,842	1,447,434

The status of the anthracite and coke furnaces was as follows on October 1, as compared with the preceding month:

Coke and Anthracite Furnaces in Blast.

	October 1.			September 1.	
Location of furnaces.	Number of stacks.	Number in blast.	Capacity per week.	Number in blast.	Capacity per week.
New York	14	6	6,980	8	7,780
New Jersey	6	3	2,478	3	2,917
Spiegel	3	0	0	0	0
Pennsylvania:					
Lehigh Valley	28	13	7,400	15	8,802
Spiegel	1	0	0	0	0
Schuylkill Valley	14	8	7,882	8	8,719
Low. Susquehanna	10	7	5,418	7	5,915
Lebanon Valley	12	7	4,530	7	4,918
Pittsburgh Dist	34	34	84,410	32	80,280
Spiegel	0	0	0	0	0
Shenango Valley	19	17	27,700	17	24,893
Western Penn	21	16	20,166	18	20,182
Maryland	5	4	5,733	4	5,832
Wheeling Dist	11	10	16,443	10	16,808
Ohio:					
Mahoning Valley	15	13	23,526	11	21,420
Cent. and North	14	13	25,788	13	25,766
Hocking Valley	3	2	630	2	632
Hanging Rock	11	9	4,907	9	5,183
Illinois	19	16	32,744	16	33,156
Spiegel	1	1	833	1	918
Minnesota	1	1	1,400	1	1,400
Wisconsin	5	4	4,181	4	4,181
Colorado	3	2	3,171	2	3,171
The South:					
Virginia	23	16	10,866	14	9,174
Kentucky	7	6	2,107	6	2,042
Alabama	40	32	29,500	30	26,876
Tennessee	16	15	8,042	13	6,555
Totals	337	256	336,829	252	328,243

During September Poughkeepsie in New York, one Bethlehem in the Lehigh Valley, one Bird Coleman and Paxton in Central Pennsylvania, one Cambria, Mabel and Rebecca in Western Pennsylvania, Benwood in the Wheeling district and Sarah in Ohio were blown out. The stacks blown in were Lochiel, Soho, and Claire in Pennsylvania, Steubenville, Belfont, Ohio and Hubbard in Ohio, Allen's Creek, Searles and one South Pittsburgh in Tennessee and one Sloss in Alabama.

The status of the charcoal furnaces was as follows:

Charcoal Furnaces in Blast.

	October 1.			September 1.	
Location of furnaces.	Number of stacks.	No. in blast.	Capacity per week.	No. in blast.	Capacity per week.
New England	7	3	250	3	226
New York	3	1	51!	2	586
Pennsylvania	5	2	90	3	152
Maryland	1	0	0	0	0
Virginia	3	2	98	2	96
Ohio	8	5	380	5	381
Kentucky	3	0	0	0	0
Tennessee	1	0	0	0	0
Georgia	4	3	882	3	988
Alabama	5	4	1,400	3	1,181
Michigan, Missouri and Wisconsin	10	7	3,350	6	3,086
Washington	1	1	100	1	100
Texas	4	1	150	1	150
Totals	55	29	7,211	29	6,946

During September Copake in New York, Glen in Pennsylvania and Vesuvius in Ohio were blown out and Olive in Ohio, Peninsula in Michigan and Coosa in Alabama were blown in.

The position of furnace stocks, sold and unsold, as reported to us, was as below on October 1, as compared with the five preceding months, the same furnaces being represented as in former months. This does not include the holdings of the steel works producing their own iron:

Stocks.	May 1.	June 1.	July 1.	Aug. 1.	Sept. 1.	Oct. 1.
Anthracite and Coke	63,583	57,231	61,312	64,059	63,666	62,651
Charcoal	20,276	15,977	13,725	13,071	15,873	13,250
Totals	83,859	73,208	75,037	77,130	79,539	75,901

John E. Wright, president of the La Belle Iron Works of Steubenville, Ohio, with H. C. Greer of the same company, has acquired 230 acres of fine coal land in the vicinity of Womesdorf, on the Roaring Creek & Charleston Railroad, at a price said to be $31,200. The La Belle Iron Works intend to immediately develop this property and build a number of coke ovens.

The Iron and Metal Trades.

Our regular monthly statement of the condition of blast furnaces shows that notwithstanding the great difficulty in securing a satisfactory supply of fuel the production in the month of September was only about 60,000 tons under that of August. This may be considered remarkable under the circumstances. During September so many complaints were heard relative to the banking of furnaces on account of shortage of fuel that it would not have been surprising to find the production very heavily decreased. The monthly production is quite regularly running a trifle under 1,500,000 tons. The number of furnaces in blast October 1 was 285, with a weekly capacity of 345,040 gross tons, against 281 on September 1, with a total weekly capacity of 335,189 tons. The increased capacity as compared with the slight change in the number of active furnaces is due to the blowing in of some furnaces of large size and the blowing out of some small furnaces.

The production of Pig Iron and Steel Billets is still considerably short of the country's requirements. Importations continue on a large scale and further transactions in foreign Pig Iron have occurred during the week. Foreign Pig Iron is the almost sole dependence of foundrymen along the seaboard and in a great portion of the Central West, who desire quick shipments. Deliveries on contracts of domestic Iron are much in arrears and foundrymen are steadily in the market for additional quantities to cover their necessities. Nothing is doing in Bessemer Pig Iron for importation.

The foreign Billet trade is greatly upset by the attitude of certain customs officials in changing the basis on which the duty is levied. The question has been appealed, but meanwhile orders for considerable quantities of German Billets have been either canceled or will be held in abeyance until the decision of a higher authority is announced. A great deal of feeling has been caused by the attempt to advance the rate of duty, as important manufacturing interests have for some time been dependent on a supply of foreign Billets and they will be put to serious disadvantage if compelled to pay the increase in cost. Our Philadelphia advices, however, are to the effect that the German makers are in some cases reducing their price to offset the increase in duty.

The Coke situation is developing into a very decidedly disturbing factor. Shipments of Coke from the ovens are so hampered by the lack of transportation facilities that consumers are in serious straits in many sections of the country for lack of Coke to run not only blast furnaces but foundries. Very high prices have been paid during the week. Some Eastern buyers of Coke have been obliged to pay $12 per ton at the ovens.

The Anthracite Coal strike is rapidly coming to a crisis. The operators having received what they demanded—namely, full protection of all workmen who desire to return—it is incumbent on them either to make their word good and speedily begin to mine Coal or acknowledge that they have been defeated. It is the general impression that the ample protection now given to workmen by the calling out of the entire National Guard in Pennsylvania will result in the miners returning to work.

Large sales of Plates are reported at Pittsburgh, to be used by Lake shipbuilders, aggregating possibly 30,000 tons.

Sales of 100,000 tons of Bessemer Pig Iron have been made at Pittsburgh for shipment in first quarter and first half of next year at $20.50 to $21 at furnace.

The conference between T. J. Shaffer, president, and John Williams, secretary, of the Amalgamated Association of Iron, Steel and Tin Workers, and the vice-presidents of districts and Conference Committee of the American Tin Plate Company, was adjourned in New York to-day without any agreement having been arrived at regarding the plan for the manufacture of "drawback" Plates in this country. When negotiations will be resumed is not now known.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one month and one year previous.

	Oct. 8, 1902.	Oct. 1, 1902.	Sept. 10, 1902.	Oct. 9, 1901.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$22.00	*$22.00	*$22.00	$15.00
Foundry Pig No. 2, Southern, Cincinnati	*22.25	*22.25	*21.75	13.75
Foundry Pig No. 2, Local, Chicago	*23.00	*23.00	*23.00	14.50
Bessemer Pig, Pittsburgh	*21.75	*21.75	*21.75	15.85
Gray Forge, Pittsburgh	*20.50	*20.75	*21.25	13.75
Lake Superior Charcoal, Chicago	*26.00	*26.00	*26.00	17.00
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	†29.00	†29.50	†29.00	26.50
Steel Billets, Philadelphia	†27.00	†27.00	†27.00	26.50
Steel Billets, Chicago	†30.00	†29.50	†30.50	....
Wire Rods, Pittsburgh	35.50	35.50	36.00	34.50
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	19 00	19.00	18.50	13.50
O. Steel Rails, Philadelphia	21.50	21.50	21.50	17.75
O. Iron Rails, Chicago	25.00	25.00	25.00	21.00
O. Iron Rails, Philadelphia	25.00	25.00	24.00	20.00
O. Car Wheels, Chicago	22.50	21.00	21.00	16.00
O. Car Wheels, Philadelphia	19.50	19.75	20.00	16.50
Heavy Steel Scrap, Chicago	18.50	18.50	18.50	13.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.92½	1.92	1.92	1.62½
Common Iron Bars, Chicago	1.80	1.85	1.90	1.10
Common Iron Bars, Pittsburgh	1.80	1.80	1.80	1.50
Steel Bars, Tidewater	1.80	2.00	2.00	1.65
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater	2.00	2.00	2.00	1.75
Tank Plates, Pittsburgh	1.75	1.75	1.75	1.60
Beams, Tidewater	2.10	Nom.	Nom.	1.75
Beams, Pittsburgh	Nom.	Nom.	Nom.	1.60
Angles, Tidewater	2.10	Nom.	Nom.	1.75
Angles, Pittsburgh	Nom.	Nom.	Nom.	1.60
Skelp, Grooved Iron, Pittsburgh	2.00	2.02½	2.10	1.90
Skelp, Sheared Iron, Pittsburgh	2.10	2.10	2.15	2.00
Sheets, No. 27, Pittsburgh	2.65	2.75	2.85	3.15
Barb Wire, f.o.b. Pittsburgh	2.50	2.50	2.90	2.90
Wire Nails, f.o.b. Pittsburgh	1.90	1.90	2.05	2.25
Cut Nails Mill	2.05	2.05	2.05	2.00
METALS:				
Copper, New York	11.55	11.55	18.50	16.50
Spelter, St. Louis	5.25	5.30	5.15	4.05
Lead, New York	4.10	4.10	4.10	4.37½
Lead, St. Louis	4.00	3.97½	3.97½	4.25
Tin, New York	25.00	25.30	27.00	24.40
Antimony, Hallett, New York	7.75	7.75	8.00	8.50
Nickel, New York	40.00	40.00	40.00	60.00
Tin Plate, Domestic, Bessemer, 100 lbs., New York	4.19	4.19	4.19	4.19

* For 1903. † Foreign.

Chicago.

FISHER BUILDING, October 8, 1902.—(*By Telegraph.*)

Several large melters of Pig Iron have purchased more freely during the week of both foreign and domestic brands for delivery mainly for the first half of next year, but one sale of moment has been made for the balance of the current year. Aside from these larger purchases and an improved demand for spot Iron, the general features of the market have not changed essentially, Coke being as scarce and as valuable as ever. There have also been freer purchases of Bar Iron, mainly by the same interest which has purchased most liberally of Pig Iron. In the light of the recent reduction of prices on Sheets, Wire and Nails it is significant that the largest manufacturer of Merchant Pipe has issued a circular to the trade advising that it is well to reduce stocks to the minimum. It is notable that the keen competition on Pipe is also affecting Boiler Tubes and that much larger discounts are now made by independent mills. Mills have been very quiet and even Structural Material has been less active. Rails and Plates seem to be the only Steel products for which there is a continuous, active and even urgent demand. The strength of the Old Material market is remarkable in the face of less liberal buying by mills and the closing down of some of the Open Hearth furnaces in this section, but the offerings are light and only in exceptional instances is there any tendency toward lower prices. On the other hand, Old Rails and Car Wheels are higher.

Pig Iron.—Car shops, Car Wheel manufacturers and Pipe workers have been the principal buyers in the local market during the past week. In all, about 30,000 tons have been taken by such consumers, but while Pipe works have purchased foreign Iron the other melters have

given preference to domestic material. About 10,000 tons of Scotch and German Iron are said to have been purchased on the basis of previous quotations and of such grades as would correspond to domestic No. 3 Foundry and Mill grades, deliveries to be made during November and December of the current year. Car shops are reported to have taken about 9000 tons of Virginia Iron for delivery during the first half of next year on the basis of quotations. Another lot of 10,000 tons of various grades of Southern, local and foreign brands are said to have been sold for the second quarter of next year. Aside from these transactions business has been largely confined to spot Iron, for which there has been a more active and urgent demand than for several weeks, with sales in car lots up to 300 tons, aggregating about 1000 tons, on the basis of $27.65 to $28.15 for No. 1 and $27 to $27.15 for No. 2. There was also a sale of 500 tons of No. 2 Foundry Tennessee Iron on the basis of $27.15, Birmingham, for delivery during November and December of this year. Early in the week single car lots of No. 2 local Iron were sold at $26.50, but at the close none is obtainable under $27. One hundred tons of Silvery Iron, 4 per cent. silicon, has been sold at $29.15 and smaller lots ranging up to $31.15 for 8 per cent. Small lots of foreign Iron ranging from one carload to 100 tons have been sold at $26 to $27 for No. 2 spot or on cars in transit from the Eastern seaboard. Foreign Iron to be shipped from abroad will not bring within several dollars a ton, duty paid, of the Iron which is already in this country. There has been no improvement in the Coke supply and local furnaces previously banked have been unable to resume. Word is also received that the Tennessee Coal & Iron Company's furnaces have been banked because of the strike. The following are the prices current for delivery during the first half of 1903:

Lake Superior Charcoal	$26.00 to $27.00
Local Coke Foundry, No. 1	23.50 to 24.00
Local Coke Foundry, No. 2	23.00 to 23.50
Local Coke Foundry, No. 3	22.50 to 23.00
Local Scotch, No. 1	24.00 to 24.50
Ohio Strong Softeners, No. 1	25.50 to 26.50
Southern Silvery, according to Silicon	24.10 to 24.50
Southern Coke, No. 1	24.15 to 24.65
Southern Coke, No. 2	23.65 to 24.15
Southern Coke, No. 3	23.15 to 23.65
Southern Coke, No. 1 Soft	24.15 to 24.65
Southern Coke, No. 2 Soft	23.65 to 24.15
Foundry Forge	22.15 to 22.65
Southern Gray Forge	21.65 to 22.15
Southern Mottled	21.65 to 22.15
Southern Charcoal Softeners, according to Silicon	27.15 to 27.65
Alabama and Georgia Car Wheel	27.00 to 27.50
Malleable Bessemer	24.00 to 25.00
Standard Bessemer	25.00 to 26.00
Jackson County and Kentucky Silvery, 6 to 8 per cent. Silicon	27.60 to 28.60

Bars.—Railroads and car shops have been freer buyers during the past week or ten days and some round lots aggregating about 10,000 tons have been sold on the basis of 1.80c., Chicago, mill shipment. Smaller lots, ranging from 20 to 60 tons, have been sold at 1.85c., Chicago, mill shipment. The smaller sales have been made for prompt delivery, while the larger sales extend into the first part of next year. There has been some little improvement in the demand for Soft Steel Bars, but offerings have been freer by smaller manufacturers and second hands. The following are the prices current: Soft Steel Bars, 1.75c. to 1.90c.; Hoops, 2.10c. to 2.25c.; Angles, 1.85c. to 1.95c., base, mill shipments. The jobbing demand for Bars, Angles and Hoops has been only moderate, but prices have remained steady. Bar Iron is selling at 2.25c., Soft Steel Bars at 2c. to 2.25c., Angles at 2.40c., and Hoops at 2.40c. to 2.55c., from store.

Structural Material.—There has been liberal specifying on old contracts and considerable inquiry, but as the deliveries acquired cannot be promised, the number of contracts placed for next year's delivery has not been large. There continues to be some inquiry for foreign Steel, but the sales consummated are of only minor importance. Beams are quoted at 2c and Angles at 2.10c., Chicago. The prices current for domestic Steel, mill shipment, are as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 1.75c. to 1.85c. Dealers having local stocks find no difficulty in obtaining a premium of $2 to $5 per ton over prices quoted: Beams and Channels are selling at 2.50c. to 3.50c., Angles at 2.50c. to 3.50c. and Tees at 2.55c. to 3.50c. at local yards.

Plates.—If possible the market for Plates is stronger than ever, the supply being without improvement and the mills being sold ahead further than ever. The following are the prices current: Tank Steel, ¾-inch and heavier, 1.75c. to 2.25c.; Flange, 1.85c. to 2.35c.; Marine, 1.95c. to 2.50c. The demand for small quantities for immediate shipment from local stock has continued active and pressing and the following prices are readily obtained: Tank Steel, ¼-inch and heavier, 2.30c. to 2.50c.; Tank Steel, No. 8, 2.35c. to 2.55c.; Flange, 2.45c. to 2.65c., all f.o.b. warehouse, Chicago.

Sheets.—The result of keen competition, which has been apparent in this line for several months, has culminated in lower prices, which are now openly quoted. The jobbing demand has been fair, and with stocks large and some pressure to sell buyers have not entered the market as freely as might be. Prices are as follows: No. 20 Black Sheets sell at 2.60c. to 2.65c. and No. 27 at 2.80c. to 2.85c., mill shipment. For small lots from store 3.10c. to 3.20c., Chicago, is obtained. Galvanized Sheets are selling at 3.35c. to 3.40c. net, mill shipment, while small lots are selling at 3.80c. to 4c. net, from store, for No. 27. Where sales are made at other than net prices discounts varying from 70 and 10 and 5 to 75 are made on the base price.

Cast Pipe.—There has been a fair movement of small lots to water and gas companies and railroads, but few large municipal contracts have been closed, although several are pending. The market is stronger in tone, manufacturers having advanced prices for small lots as follows: 4-inch, $37; 6-inch, $36; 8-inch and upward, $35; Gas Pipe, $1 per ton higher, all f.o.b. Chicago.

Billets.—A very quiet market has been experienced during the week, the demand for foreign material especially being less active; indeed, with freight rates much higher business has been practically suspended. Foreign Open Hearth Basic Billets are nominally quotable at $30, Chicago. Domestic Bessemer Billets are nominal at $32 and Open Hearth Basic are held at $35 to $37. Negotiations are pending on 3000 tons special analysis, high carbon, at $36, for delivery running into the first quarter of next year. Small lots are selling at $38 to $40, Chicago.

Merchant Pipe.—There has been no improvement in the demand, and the market has continued unsettled and irregular, due to keen competition. Even the jobbing demand is only moderate. The following are the prices current, random lengths, Chicago: Black, ⅛ to ½ inch, 56½ off; ¾ to 12 inches, 63½ off; Galvanized, ⅛ to ½ inch, 43½ off; ¾ to 12 inches, 50½ off. Some manufacturers are making the following prices for mill shipments, Chicago: Random lengths, Black, ⅛ to ½ inch, 60 off; ¾ to 12 inches, 67 off; Galvanized, ⅞ to ½ inch, 48 off; ¾ to 12 inches, 56 off.

Boiler Tubes.—In sympathy with Merchant Pipe the market has been quiet and easier in tone, but without essential change in prices, which for mill shipment are as follows:

	Steel.	Iron.
1 to 1½ inches	42½	39
1¾ to 2½ inches	55½	38
2¾ to 5 inches	61	48
6 inches and larger	55½	38

The market for small lots from store is without animation, but prices are without quotable change. We quote:

1 to 1½ inches	35	35
1¾ to 2½ inches	47½	32½
2¾ to 5 inches	55	42½
6 inches and larger	47½	..

Merchant Steel.—Shipments into this territory of this line of Steel during the month of September have been unusually large, one large company reporting the movement in September, 1902, the largest of any September in the history of the company, the shipments being little short of the heaviest month previously experienced. The higher prices demanded for Billets of special analysis have encouraged some manufacturers of Spring Steel to demand higher prices in some instances, but this is the exception rather than the rule. For mill shipment prices are as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.95c. to 2.10c.; Open Hearth Spring Steel, 2.65c. to 2.75c.; Toe Calk, 2.25c. to 2.40c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 47 off in carload lots and 42 off in less than car lots. Ordinary grades of Crucible Tool Steel are quoted at 6½c. to 7c. for mill shipment; specials, 12c. upward.

Rails and Track Supplies.—Western mills have taken orders for between 10,000 and 12,000 tons of Heavy Sections for next year's delivery, and further orders have been booked for like sections on the basis of previous quotations. There is still an active inquiry from railroads and electric lines who have not yet covered requirements for 1903, and some important transactions are said to have been closed by Eastern mills. Negotiations are still pending on foreign Sections, and some resales of moment of domestic Sections are being negotiated. One lot of 2800 tons Standard Sections, domestic Rails, were resold for delivery at Beaumont, Texas, at $33. Official prices continue firm at $28 for Standard and $27 for Second Quality, mill shipment. Lighter Sections sell from $32 to $35 in carload lots, according to weight and time of delivery. Jobbing quantities continue to command a premium of $3 to $5 per ton. Track Supplies have continued to sell well at full prices, which are as follows: Splice Bars or Angle Bars, 2c.; Spikes, 2.50c.; Track Bolts, with Hexagon Nuts, 3.10c. to 3.45c.; Square Nuts, 2.95c. to 3.10c.

Old Material.—Some of the local railroads have been able to obtain higher prices for certain grades of Old Material, including Grate Bars, Frogs and Light Sheets, than ever before, but while the supply of domestic Scrap is light there is a less urgent demand, several of the Bar mills being still closed, and deliveries of Pig Iron purchased at low prices months since being in more ample supply. There has been quite an active demand for Old Steel Rails, both for remelting and relaying. Five hundred tons, long lengths, remelt-

ing, sold at $23.50; 260 tons of Heavy Relaying Rails sold at $22.50, and 600 tons, in lots of 200 and 400 tons each, at $32, Chicago. Old Car Wheels are especially scarce and wanted. One small sale was made during the week at $22.50. The following are the prices current per gross ton, Chicago:

Old Iron Rails	$25.00 to $25.50
Old Steel Rails, mixed lengths	19.00 to 19.25
Old Steel Rails, long lengths	23.50 to 24.50
Heavy Relaying Rails	32.00 to 32.50
Old Car Wheels	22.50 to 23.00
Heavy Melting Steel Scrap	18.50 to 19.00
Mixed Steel	15.50 to 16.00

The following quotations are per net ton:

Iron Fish Plates	$22.50 to $22.75
Iron Car Axles	25.00 to 26.00
Steel Car Axles	23.50 to 24.00
No. 1 Railroad Wrought	21.50 to 22.00
No. 2 Railroad Wrought	.... to 19.00
Shafting	20.00 to 21.00
No. 1 Dealers' Forge	17.50 to 18.00
No. 1 Busheling and Wrought Pipe	15.00 to 15.50
Iron Axle Turnings	15.00 to 15.50
Soft Steel Axle Turnings	14.50 to 14.75
Machine Shop Turnings	14.25 to 14.75
Cast Borings	10.25 to 10.75
Mixed Borings, &c	10.50 to 11.50
No. 1 Boilers, cut	14.50 to 15.00
Heavy Cast Scrap	17.00 to 17.50
Stove Plate and Light Cast Scrap	12.50 to 13.00
Railroad Malleable	16.25 to 16.75
Agricultural Malleable	15.50 to 16.00

Metals.—Ingot Copper has been quiet, and the market closed a little easier in tone in sympathy with prices at primary points. Lake is quotable at 12c. in car lots, and 12¼c. to 12¾c. in a jobbing way. Pig Lead has continued in good demand and firm at 4.05c. in 500-ton lots and 4.07½c. in carload lots. Sheet Zinc has remained firm with a good demand at 6½c. in carload lots, and 6.65c. in lots of 600 lbs. Old Metals have been moderately active, and prices have been well sustained, as follows: Heavy Cut Copper, 10¾c.; Red Brass, 10½c.; Copper Bottoms, 9½c.; Lead Pipe, 3.90c.; Zinc, 3.75c.

Coke.—The little spot Foundry Coke available, from whatever source obtained, has been sold at $12 per ton on track, with exceptional sales at a premium of $1 to $2 a ton. Not enough Coke can be obtained for furnaces to enable the stacks already banked to resume. Few, if any, contracts are being made for next year's delivery, and there has been little, if any, improvement in shipments made on old contracts.

T. S. Casey, local agent of the Wheeling Steel & Iron Company, and L. A. Thompson of the Crane Company, have entered into business relations, forming the firm of Casey & Thompson, who have been incorporated under the laws of Illinois. The new relations become operative October 15, although business since the first of the month has been transacted by the new firm. The office is located in the Marquette Building, Chicago.

Hollingshead & Blei Company, Chicago, announce that on and after October 1, 1902, the Hoop Steel department of J. D. Hollingshead and the Iron and Steel commission business conducted by George F. Blei will be consolidated under the name of the Hollingshead & Blei Company. This will not interfere with existing contracts, as they will be assumed by the new company. The offices will be at 218 La Salle street, Room 915.

Philadelphia.

FORREST BUILDING, October 7, 1902.

The strained condition of affairs has become considerably more acute than it was a week ago. The shortage of Iron appears to be fully met by the receipts of foreign material, but if the Coke and Coal famine is not relieved in the very near future there will be no use for Iron, either foreign or domestic. There is no dependable price for Coke, as it cannot be had, except a few cars at irregular intervals, for which anywhere from $10 to $14 has to be paid. Week by week, however, the supply gets less, and the price so much higher that the time is approaching when it will not be worth while trying to resist what may soon become the inevitable. That is to say, if the strike continues large consumers will stop work until there is reasonably satisfactory assurances of a return to something akin to normal conditions. The present situation is intolerable, the more so as it might have been avoided if the law had been properly enforced. With such supineness as exists in high places, however, there is very little prospect for better conditions until there is a tremendous revulsion in the public feeling. Disintegration is talked about as the final panacea, but in the meanwhile disintegration is progressing in other directions, and it will be a piece of rare good fortune if business is not disintegrated beyond recovery unless heroic measures are adopted. Until these excrescences on the business situation are removed, it would be a waste of time to talk about good business or good business prospects. Normal conditions must be restored before there is even a chance of anything approaching to satisfactory business prospects. The surprise which was sprung on the buyers and consumers of foreign Steel last week was somewhat obscured by the anticipations of a favorable outcome of the meeting of the mine operators in Washington on last Friday, and while the coal situation is still of commanding interest the Steel matter will have to be dealt with. The fact that the claim for $2.24 per ton additional duty on Billets is retroactive and carries penalties, imparts an importance to the affair which was not thought of a week ago. Neither was the possibility of Canadian Steel being included considered at that time, but it is said that the claim will be made, but whether it can be sustained or not is a matter of opinion. Duties are being paid under protest, and it is hoped that at least some compromise will be arranged, as it is a serious matter in view of the heavy tonnage and its wide distribution.

Pig Iron.—There is not the slightest change from last week as regards prices. Sales are trifling compared with what they were during the summer months, but beyond providing for immediate necessities there is no desire to do business until the outlook becomes clearer. Makers of Pig Iron are expecting a high cost of production during the coming year, but with such continued evidence that foreign material can be brought in with a fair margin of profit, at the prices now ruling, buyers are not in the least anxious to make extended engagements. An occasional sale is made on the basis of $22 to $22.50 for No. 2 X Foundry for next year's deliveries, but, as a rule, there is a feeling of indifference, which is in marked contrast to the eagerness which was manifested during the summer months. Furnaces are making very poor deliveries, however, as the majority are working so irregularly that 50 per cent. of a normal output is probably all that can be got out of them. But for foreign Iron half the foundries would have been closed by this time, but with arrivals of 2000 to 4000 ton cargoes several times a week there is plenty of Iron to go on with. The main difficulty now is to get Coke. All sorts of reports are around in regard to the inferior quality of European Iron and the consequent cancellation of orders, but so far as concerns this vicinity there is a singular unanimity of favorable opinions. Scotch Iron has fully maintained its old time reputation. Middlesbro Iron appears to be of better quality than it was 20 years ago. Westphalian Iron analyzes so close to the Pennsylvania No. 2 Plain that it might be the very same Iron and gives entire satisfaction. Luxemburg Irons have been sold here on a satisfactory analysis, and when delivered to consumers are expected to be in accordance therewith. A lot of 1000 tons (not yet arrived) has been sold at about $20.65, ex-ship, duty paid. It is difficult to quote these Irons very closely, because the conditions are so varied. There is a great deal more work in handling them, and a great deal more risk than in domestic Irons: 1, because it requires careful management to arrange for deliveries immediately on arrival of the vessel; and, 2, because it requires an immediate outlay of a good deal of money, as in most cases it is cash against bill of lading. Buyers who can take cargo lots can get in at a very much less price than those who take 100 or 200 tons on terms of credit usual on American Irons. Cash buyers of imported Irons have therefore a good margin in their favor, so that quotations on the same brands and same qualities may vary $1, too, in some cases nearly $2 per ton. A fair average of values would be about as follows alongside ship, duty paid:

Low Phosphorus	$22.00 to $22.50
East Coast Bessemer	21.50 to 22.00
No. 3 Middlesbro	20.50 to 21.00
Scotch, No. 1	22.50 to 23.50
Scotch, No. 3	21.00 to 21.50
Westphalian, No. 2, Plain	20.50 to 21.25

American brands for city or nearby deliveries during the first half of next year may be quoted as follows, and $1 to $1.50 more for this year's deliveries:

No. 1 X Foundry	$23.50 to $24.50
No. 2 X Foundry	22.00 to 22.50
No. 2 Plain	21.00 to 22.00
Standard Gray Forge	19.50 to 20.50
Basic	20.50 to 21.00

Billets.—The market is unsettled, but there is not much demand at the moment. It is difficult to find out what prices really are, but German Steel is offered at a reduction, which will completely offset the advanced rate of duty, so that business can still be done on the basis of somewhere around $27 to $28 for Ordinary Basic Bessemer Steel, but there is a disposition to wait further developments before making definite engagements.

Plates.—There is an excellent demand, and mills would have no difficulty in securing several weeks' full work on the basis of 2c. at mill, but manufacturers are very conservative and not willing to take too big a load. Car building is taking large lots of Plates and this with locomotive, bridge and ship work is absorbing an exceedingly heavy tonnage. Prices are strong at figures last quoted—viz.: Small lots, 2.10c. to 2.15c.; carload lots, ¼-inch and thicker, 2c. to 2.05c.; Universals, 2c. to 2.05c.; Flange, 2.10c. to 2.20c.; Fire Box, 2.25c. to 2.30c.; Marine, 2.30c. to 2.35c.; Charcoal Plates, C. H. No. 1, 2½c.; C. H. No. 1 Flange, 3c.; C. H. No. 1 Flange Fire Box, 3½c.

Structural Material.—There is a good demand, but there are very distinct indications that the great stringency is about over. The volume of business is probably as large as ever, but increased production in connection with heavy receipts from abroad is reducing the pressure for deliveries and most of the mills are accepting business at less money than of late. Some specifications are taken by Western mills at about 1.72c., delivered, but for strictly prompt shipments local sellers quote 2.1c. to 2.25c. for ordinary sizes, but a good deal depends on the circumstances in each particular case, although, as already stated, the market is distinctly easier.

Bars.—The feeling is not as confident as it has been until recently, some mills being rather anxious to get business. There is no positive slackness, but there is less snap to the market, buyers being quite indifferent as regards anything beyond the next 30 to 60 days, and even that is fairly well covered. Steel Bars are easier, and, except large sizes, 1.72c. to 1.80c. can easily be done on a nice specification. Local mills, however, seem to get plenty of business at better prices than the above and are running to full capacity. Refined Iron commands 1.92½c. to 1.97½c. and steady.

Sheets.—The demand for Sheets is very slow and the matter of prices seem to have very little influence. When a good sized order is offered it is taken on easy conditions, but the mere fact that prices are ¼c. lower seems to make no difference.

Old Material.—The market is quite firm and full prices are paid for almost everything on the list. A lot of Old Steel Rails brought over $22, delivered to a nearby mill, but the general market is indicated by the following for lots delivered in buyers' yards:

Old Steel Rails	$21.50 to $22.00
Heavy Steel Scrap	20.75 to 21.25
Low Phosphorus Scrap	26.50 to 28.00
Old Steel Axles	26.00 to 27.00
Old Iron Rails	25.00 to 26.00
Old Iron Axles	30.00 to 31.00
Old Car Wheels	19.50 to 20.25
Choice Scrap, R. R. No. 1 Wrought	24.00 to 25.00
Country Scrap	21.00 to 22.00
Machinery Cast	19.50 to 20.50
No. 2 Light Scrap	17.00 to 18.00
No. 2 Light (Ordinary)	14.50 to 15.00
Wrought Turnings	16.00 to 17.00
Wrought Turnings, Choice Heavy	18.00 to 18.50
Cast Borings	10.00 to 10.50

Imports.—Imports October 1 to 4 inclusive are as follows:

			Value.
Iron Ore	tons.	15,520	$18,040
Ferromanganese	"	238	9,270
Pig Iron	"	4,000	58,863
Scrap Iron	"	1,322	13,049
Scrap Steel	"	390	5,472
Blooms	"	300	9,354
Steel Ingots	lbs.	9,563,079	86,177
Beams, Angles, Shapes	"	493,753	6,290

Excluding the Iron Ore and Ferromanganese the imports in the four days were 11,039 tons; value, $179,205.

Cleveland.

CLEVELAND, OHIO, October 7, 1902.

Iron Ore.—The statement has just been compiled showing the shipment of ore down the lakes during the month of September to have been 3,657,080 tons, a gain over the same month of last year of 763,411 tons. The total movement to October 1 has been 20,708,610 tons, which makes the increase up to October 1 amount to 5,551,505 tons, or 36 per cent. The total shipment to October 1, therefore, by lake alone, is in excess of the total movement, lake and rail, for the entire season of 1901. This being the case an enormous gain this year over last is a thing easy of accomplishment. With the gain of 5,500,000 tons, in round numbers up to October 1 it means that if the shipment in October and November this year is as heavy as last year the total movement for the season will be 26,000,000 tons, since the total movement for last year was 20,500,000 tons. The shippers, however, are talking of moving only 24,000,000 tons this season. If that is done the business for the year will be speedily over. If what is yet to be carried is strung out over the next two months there will not be a very active call for vessels this fall. At all events the rate prospects are none too bright for the vessel owners, too much of the material having been brought down while the Ore shippers had no competitors for tonnage. The movement is being delayed now by the worst car shortage of the year. Many of the larger boats are detained a week or more in port discharging their cargoes. The rates of carriage remain unchanged at 75c. from Duluth, 65c. from Marquette, and 60c. from Escanaba.

Pig Iron.—The Coke supply in the Valleys has again discommoded a few of the furnaces. Toward the latter part of last week those which had banked a few days earlier were able to resume operations, but after three days of service they again fell short of Coke and had to bank Monday morning. It seems, however, that the present shortage is due to a railroad accident, which prevented shipment for Saturday afternoon and Sunday, consequently the shortage may be considered as purely temporary. The furnace companies have not been able to collect any surplus for such an emergency and their condition is precarious, to say the least. The curtailment of production some time ago disposed of all possibilities of a surplus over contracts to take care of the open market demands, and the producers are not offering a pound for delivery during the last quarter of this year. Such a condition of the market places the sole reliance of the consumers in the supplies from abroad. Importations have continued, but it cannot be learned that any new orders were placed this week. It seems that contracts already placed have about taken care of the urgent needs of the market for the remaining three months of the year. Scotch Irons are being sold here at $25.50 for No. 1 and $24.50 for No. 2, while Nova Scotia Irons are still bringing $23.50. Preference is given to the Scotch Irons, since they measure up closer to the market needs. The Valley furnaces have no material for sale for this year's delivery and the Southern Ohio and Southern furnaces are about in the same predicament, with little or no relief from Virginia. The possibility of the curtailed production of Pig Iron this fall affecting the supply for next year is apparent. Applications to furnaces for deliveries on contracts have been urgent during the week. It seems however possible that many of the furnacemen will not be able to fill this year's contracts much before the middle of February or March 1, if the orders are filled by that time. Producers are making promises for the first half guardedly and it is learned to-day that some contracts have been placed at $23 for No. 2 Foundry Iron in the Valleys for first half delivery. Some sales have also been made into the third quarter of next year at $21 for No. 2, Valley furnaces. Southern furnaces have stiffened their prices some and material for the first half of next year is being sold at $18.50 to $20, Birmingham, for No. 2 Foundry, with the latter price more nearly representing the market. There is no Basic Iron for sale this year and a quotation is out of the question. It is even impossible to find a quotation that will represent the market for the first half of next year. The producers say that they are expecting to be able to keep in blast only about two-thirds of the time, in which event they will be kept busy until July 1 with contracts which ought to have been filled by April 1. On this account the producers are not making any promises of delivery of material for the first half other than already made. One Pittsburgh jobber sold a small lot of Bessemer on the market this week at $23.20, Valley furnace, for fourth quarter delivery this year, but this is the only quotation possible.

Finished Iron and Steel.—The pessimists on the market have been disarmed by events which are occurring constantly. Frequent predictions have been made that the present year would wear out the activity of the Steel business, but regardless of all such comments the prospects seem to be as bright for next year as they have been at any time heretofore. The ordering of material of all kinds keeps up. It seemed for awhile as if the anthracite coal trouble would affect the market disastrously to the producers, but it seems this week as if the crisis has been passed, and still the market has not been seriously disturbed, which has given occasion for a very strong feeling among the producers. In Structural Shapes the demand has kept up very well. The larger mills still have some uncovered capacity for the first half of next year, with possibilities of deliveries being made in limited quantities during the first quarter. The larger mills have adhered to the old basis of prices, 1.70c., and have been able to scoop in a good deal of business. The jobbers have been selling such material as they have received on their contracts, and have had not the slightest difficulty in disposing of all of it. In fact, the market now shows a greater need than the jobbers can supply, which is furnishing the basis of operations for the smaller mills who are also selling material for spot delivery at large premiums. The jobbers are still getting 2.50c. to 3c. out of stock, while the smaller mills have been charging 2.60c. at the mill, and have been getting it. The possibility of the larger mills making deliveries during the first quarter deprives the mills demanding premiums of any market for their wares for the period past January 1. The Plate market does not look so bright for the consumers. It is out of the question to look for any material during this year from the big mills, other than provided for on contracts. It is equally impossible to get a ton of either Universal or Sheared Plates for delivery during the first half of next year from the larger mills, unless, of course, some one fails in taking the material he has ordered, which has been provided against by the mills refusing to sell to speculators or to those who have not the best backing. The market needs have been fairly well cared for in these enormous sales, but some few are left who are falling prey to the smaller mills and to the jobbers. The latter have advanced the stock prices of Sheared Plates for this year's delivery to 2.50c., which is the price at which Universal Plates out of stock have been selling for months. The smaller mills having material for delivery have also stiffened their prices. They are now getting without difficulty 2c. to 2.10c. at the mills for all of this year. Some contracts have been taken in this territory for delivery during January, and one contract is reported to entail deliveries up to April 1 at the premium prices. The smaller mills are demanding premium prices into next year. The reduction of $5 a ton on Black Sheets has brought out a

good deal of business, although the producers hardly expected any enormous increase in the volume. The quotations are revised as follows: For Black Sheets out of stock, 3.10c. to 3.25c., for No. 27 as a basis and mill sales at 2.75c. to 2.85c. for the same gauge. Galvanized Sheet quotations do not change, carload lots being sold on the basis of 4.50c. for No. 27, delivered, Cleveland. The Bar Steel trade does not change in the least, the output being well sold up for this year, and inquiries continuing heavy for next year's delivery. Prices hold firm at 1.60c., Pittsburgh, for Bessemer and 1.70c., Pittsburgh, for Open Hearth Steel Bars. The situation in Bar Iron is not, however, at all satisfactory, and there are evidences that all Iron products are weak. The feeling is that some considerable reductions have been made in the quotations of Bar Iron for choice specifications, but the extent of the reductions have not been made public. The nominal quotation is 1.80c., Pittsburgh. Light Rails are selling well at a variety of prices. Some mills are still quoting from $39 to $42, while some few sales have been made at $43 and upward. The difference is in the product made from Billets and the Iron Rails, the former commanding the higher prices. Deliveries are offered in from three to five or six weeks. Very little is heard of sales of Standard Rails.

Old Material.—The middlemen in the Scrap trade are caught between the upper and the nether stone. There is not a very great demand for Scrap of any kind, but the prices which the collectors are demanding make it necessary for the dealer to boost the price to the consumer if he wishes to make a profit. As this is manifestly impossible the dealer is sailing a difficult course. Quotations do not change, being as follows: No. 1 Wrought, $21, net; Iron Rails, $27.50, gross; Iron Axles, $28, net; Cast Borings, $12, gross; Wrought Turnings, $16.50, gross; Cast Scrap, $17.50, net; Car Wheels, $19, gross; Heavy Melting Steel, $19, gross; Old Steel Rails, $20, gross.

The Struthers Furnace Company will remove their offices on October 15 to Rooms 1106-1109, Citizens' Bank Building, 190 Euclid avenue, Cleveland, Ohio.

Cincinnati.

FIFTH AND MAIN STS., October 8, 1902.—(*By Telegraph.*)

The activity in Pig Iron circles just at present is confined very largely to the troubles which infest the situation. It may be said that they are plentiful and mostly of the spot delivery order. Pig Iron itself has been rather quiet so far as any new selling goes, and in a general way it may be stated that prices are practically unchanged. Ideas as to the value of foreign Iron are so much at variance that such a thing as a quotation is hardly possible. Some authorities affirm that Iron of the grade of No. 2 Southern can be laid down in Cincinnati f.o.b. for $22, while others place the figure at least $2.50 higher. The difference may possibly consist largely in quality and such other attachments as might accompany Iron coming through a Custom House and whether the Iron was being sold for account of nonresident owners or by the actual owners here might also have a material influence in determining value. There is a considerable offering of spot Southern Iron from sources not hitherto figuring as factors in the market, but this is being held at the maximum quotations given herewith rather than the minimum. The Coke situation is still acute and quotations of sales actually made f.o.b. Cincinnati at $30 a ton emphasize the fact that Coke is Coke, especially for spot delivery. The price at the furnaces ranges from $8 to $11.50 for spot delivery. Contracts for next year are made on a $3.50 to $5 range at the furnace, the difference in price being representative of quality and condition. Freight rate from the Hanging Rock district is $1.10, and from Birmingham to Ohio River points $3.25. We quote, f.o.b. Cincinnati, for 1902 delivery, as follows:

Southern Coke, No. 1	$26.25 to $27.25
Southern Coke, No. 2	25.25 to 26.25
Southern Coke, No. 3	24.00 to 24.50
Southern Coke, No. 4	21.75 to 22.50
Southern Coke, No. 1 Soft	26.25 to 27.25
Southern Coke, No. 2 Soft	25.25 to 26.25
Southern Coke, Gray Forge	19.00 to 20.00
Southern Coke, Mottled	19.00 to 20.00
Ohio Silvery, No. 1	29.60 to 30.10
Ohio Silvery, No. 2	... to ...
Lake Superior Coke, No. 1	26.10 to 26.60
Lake Superior Coke, No. 2	25.60 to 26.10
Lake Superior Coke, No. 3	25.10 to 25.60

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades	$26.75 to $27.75
Lake Superior Car Wheel and Malleable	25.00 to 26.25

Quotations for first six months of 1903, f.o.b. Cincinnati, the buyer to assume freight difference which may exist at time of shipment, are as follows:

Southern Coke, No. 1	$22.75 to $24.00
Southern Coke, No. 2	22.25 to 23.25
Southern Coke, No. 3	21.75 to 22.75
Southern Coke, No. 4	21.25 to 22.75
Southern Coke, Gray Forge	21.25 to 22.25
Southern Coke, Mottled	21.25 to 22.25
Southern Coke, No. 1 Soft	22.75 to 24.00
Southern Coke, No. 2 Soft	22.25 to 23.25
Lake Superior Coke, No. 1	25.10 to 25.60
Lake Superior Coke, No. 2	24.10 to 24.60

Old Material.—The market is still strong and active, especially for Cast Scrap. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, $21 to $21.50 per net ton; Cast Scrap, $17 to $17.50 per gross ton; Iron Rails, $24.50 to $25, gross; Steel Rails, long, $24 to $24.50, gross; Steel Rails, short, $18.50 to $19, gross; Iron Axles, $27.75 to $28.25, net; Car Wheels, $21 to $21.50, gross.

Iron Bars.—The market is quiet and uninteresting. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.92c., with half extras. Less than carload lots, 2.02c., with full extras; Steel Bars, 1.72c. for carload lots, with half extras; Base Angles, 2.25c. Plates, 3-16 and heavier, 2.15c., carload lots.

Pittsburgh.

(*By Telegraph.*)

PARK BUILDING, October 8, 1902.

Pig Iron.—The Pig Iron market continues in splendid condition, prices being very firm and inquiries heavy for Iron for shipment in first quarter and first half of next year. We note recent sales of 75,000 to 100,000 tons of Bessem Iron, all for shipment in next year at prices ranging from $20.50 to $21 at furnace. Small lots of Bessemer Iron for delivery in first quarter of next year have sold at $21.25 and higher at furnace. There is not much inquiry for Bessemer Iron for this year's delivery, but small lots bring $22 to $22.50 at furnace. Forge Iron is in better demand and prices are very firm. For this year's delivery Forge has sold at $21.50 to $21.75, Pittsburgh. For delivery in first quarter and first half of next year from $20.50 to $20.75, Pittsburgh, has been done, but the furnaces do not seem anxious to sell at these prices. There is not much inquiry for Foundry Iron, consumers being pretty well covered. No. 2 Iron in little lots for this year's delivery brings $23 to $23.50, Pittsburgh. For delivery in first half of next year a very heavy tonnage has been sold at prices ranging from $21.50 up to $22.75, Pittsburgh, the price depending on the tonnage and deliveries.

Steel.—There is a fair inquiry for Steel, but the actual tonnage being sold is not large. Foreign Billets are being offered at about $29, Pittsburgh, while domestic Billets are held at $30 to $31, the lower price being for large tonnage and extended delivery. Open Hearth Billets bring about $32 for Ordinary Carbons, and $33 to $34 for Carbons running 0.35 to 0.45. We note sales of about 5000 tons of Open Hearth Billets at these prices.

Coke.—There is a famine in Coke, and any price asked can be obtained. Furnace Coke for spot shipment has sold at $10 to $11 a ton at oven, and Coke concerns have been compelled in some cases to turn down business at these prices, not having the Coke to spare or cars in which to ship it. It looks now as though the price of Furnace Coke for delivery in first half of next year would be $4 a ton at oven. Some contracts made some time ago were at lower figures, but recent contracts for Furnace Coke has been made at $4 a ton for shipment over first six months of next year.

(*By Mail.*)

General conditions in the Iron and Steel trade this week are somewhat quiet, due partly no doubt to the heavy cut in Sheets and Wire announced last week by the leading interest. It is believed, however, that the lower prices on Sheets and Wire products will have the effect of steadying the market and giving it more stability than it has had for some time. Pig Iron continues very strong, Bessemer for this year delivery bringing as high as $22.50, at furnace. Some heavy sales of Bessemer Iron for next year delivery have been made at prices ranging from $20.75 to $21, at Valley furnace. Forge Iron for delivery this year has sold at $21.50, but is being offered for first three months of next year at about $20.50, Pittsburgh. Foreign Billets are being quoted at about $29, and Domestic at $30 to $31, depending on deliveries wanted. Plates and Structural Shapes are very active and a heavy tonnage is being placed. The balance of the market on Finished Iron and Steel is somewhat quiet.

Plates.—Some 25,000 to 30,000 tons of Plates for delivery in next year have recently been placed with Pittsburgh mills, to be used on large lake boats, which will be constructed during the coming year. Tonnage in Plates was never as heavy as it is at the present time, and prompt delivery is almost as difficult to obtain as in Structural Shapes. This is shown by the fact that prompt Plates have sold as high as 2c., Pittsburgh, and even higher has been done in exceptional cases. This is an advance of at least $8 a ton over official prices. The leading Plate mills are practically sold up for first six months of 1903, and Plates for shipment any time this year bring from 1.90c. to 2c. Official prices, which govern Plates only for indefinite delivery, are as follows: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3. Plate more than 100 inches

wide, 5c. extra per 100 lbs. Plate 3.16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days.

Sheets.—The announcement by the American Sheet Steel Company of a reduction of $5 a ton in prices of Sheets, effective to December 1 next, was not unexpected by the trade. The unsatisfactory condition of the Black and Galvanized Sheet market, both as regards demand and prices, has been referred to for some weeks past in this report and a heavy cut in prices is but a natural outcome of these conditions. Small Sheet mills who have to buy their Bars in the open market will hardly be able to roll Sheets and sell them at the new prices and make a profit. However, the reduction in prices will probably give a stability to the market that it has not had for some time. It is also hoped that it will result in an improved demand. We quote No. 27 Black Sheets at 2.65c. to 2.70c. and No. 28 at 2.75c. to 2.80c., in carloads and larger lots. Jobbers charge $2 to $3 a ton advance over these prices for small lots. The new prices on Galvanized Sheets we give in net prices and also in discounts, as some of the leading mills confine their quotations entirely to net prices, while others continue to sell on discounts. The new prices in 500 bundle lots and over are as follows: 16-Gauge, 2.60c., or 75, 10 and 2½ per cent. off; 18-Gauge, 2.85c., or 75 and 10 per cent. off; 20-Gauge, 2.85c., or 75 and 10 per cent. off; 22 and 24-Gauge, 3.10c., or 75 and 10 per cent. off; 26-Gauge, 3.35c., or 75 and 10 per cent. off; 27-Gauge, 3.60c., or 75 and 10 per cent. off; 28-Gauge, 3.85c., or 75 and 10 per cent. off; 29-Gauge, 4.35c., or 75 and 7½ per cent. off; 30-Gauge, 4.50c., or 75, 10 and 5 per cent. off. It should be noted that these prices are only for 500 bundle lots and over, and we also note that some mills are asking higher prices. All these prices are f.o.b. at mill, jobbers charging the usual advances on small lots.

Ferromanganese.—We continue to quote English and German Ferro at about $51 to $51.25, f.o.b. Pittsburgh. No domestic is being offered.

Muck Bar.—We quote standard grades of Muck Bar at $35.50 to $36, Pittsburgh. Eastern Muck Bar is being offered in this market at about $35 or less.

Spelter.—We continue to quote prime grades of Western Spelter for prompt delivery at 5.33½c., Pittsburgh. Futures are quoted slightly lower. Prompt delivery for Spelter is very hard to obtain.

Structural Material.—A very heavy tonnage continues to be placed, the leading Bridge and Structural concerns having enough work on their books to take practically their entire output for first six months of 1903. In fact, several leading Structural concerns are practically filled up for all of next year. Some figuring is being done on Foreign Beams and Channels and it would not be surprising if some business is done in this direction, largely owing to the fact that local mills are filled up so far ahead and cannot make deliveries wanted. Small lots of Beams and Channels readily bring 2½c. to 3c. for prompt shipment and even higher prices have been paid for small lots. Official prices, which apply only on indefinite delivery, are as follows: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inch, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c. to 1.85c.

Rails.—No large contracts have recently been placed, but foreign mills are capturing a good deal of tonnage for delivery in the United States, Mexico and Canada. This is owing to the fact that domestic Rail mills are so well filled up they cannot make deliveries wanted. We quote Steel Rails at $28, at mill, for Standard Sections.

Bars.—We note a moderate demand for Iron and Steel Bars, and the tone of the market is fairly strong. It is not believed that prices on Bars will be affected by the cut that has been made on Sheets and Wire. Steel Bars at 1.60c. are very close to price of Billets, and Iron Bars at 1.80c. are low compared with present prices of Muck Bar. In addition the mills are all pretty comfortably filled and are not actively seeking new tonnage. We quote Steel Bars at 1.60c., at mill. All specifications for less than 2000 lbs. of a size are subject to the following differential extras: Quantities less than 2000 lbs., but not less than 1000 lbs., 0.10c. per lb. extra. Quantities less than 1000 lbs., 0.30c. per lb. extra, the total weight of a size to determine the extra, regardless of length. We quote Iron Bars at 1.80c. to 1.85c. in carloads and 1.90c. in small lots, f.o.b. Pittsburgh, half extras as per National card.

Rods.—The market is somewhat quiet, and there is some uncertainty as to future of prices on account of the cut that has been made in Wire products. We quote Bessemer Rods at $35.50 to $36, and Open Hearth at $37 to $37.50, Pittsburgh.

Hoops and Bands.—The market is somewhat quiet, and concessions in prices are being made on large tonnage. We quote Hoops at 1.90c. for 250-ton lots and over and 2c. in carloads. Bands are 1.90c. for Bessemer stock, 12-gauge and heavier, while for Open Hearth stock $2 per ton advance is charged.

Merchant Steel.—There is a fair demand, and some small contracts have been made for material for shipment next year. There is no change in prices, and we quote: Tire, 2.15c. to 2.25c.; Spring, 2.25c. to 2.35c.; Toe Calk, 2.30c. to 2.40c., base; Sleigh Shoe, 2.15c. to 2.25c. Differentials are as follows: Less than 2000 lbs. of a size and not less than 1000 lbs., 10c. advance; less than 1000 lbs. of a size, 30c. advance; Cold Rolled Shafting is 47 per cent. off in carloads and 42 per cent. in less than carloads delivered in territory east of the Mississipi and north of the Ohio rivers. Tool Steel is 6½c. to 10c. for ordinary grades and 12c. and upward for special grades.

Merchant Pipe.—Demand for Merchant Pipe is fair, but there is some unevenness in prices, some of the outside mills making considerable concessions in order to secure tonnage. As yet the leading Tube interest has not made any change in discounts. On the larger sizes of Pipe, 6-inch and larger, the mills are filled up for several months ahead. The 300 miles of 6-inch for export, referred to in this report some time since, has not yet been placed. Discounts for carload lots, which are more or less shaded, are as follows:

Merchant Pipe.	Black.	Galvd.
⅛ to ½ inch, inclusive	60	48
¾ to 12 inch, inclusive	67	55

Skelp.—The Skelp market is very quiet, and some of the Eastern mills are actively seeking business in this district. We quote Grooved Iron Skelp at 2c. to 2.02½c. and Sheared Iron at 2.10c. to 2.15c.

Coke.—Fabulous prices continue to be paid for Coke for prompt shipment, and it is really not a question of price but where to get the Coke. Furnace Coke in large lots has sold as high as $8 a ton at the oven. We have been advised that contracts for Furnace Coke for first half of next year have been placed at $3.50 and up to $4 a ton. Output of Coke in the upper and lower Connellsville regions is running over 300,000 tons a week. The car supply on some days is good, but at other times is as bad as it possibly could be.

Old Material.—We note a continued heavy demand for nearly all kinds of Iron and Steel Scrap, particularly for Heavy Melting Stock and Cast Scrap. We quote No. 1 Railroad Wrought Scrap at $21.50 to $22 in net tons. Cast Iron Borings, $12.50 to $13, gross tons, either Valley or Pittsburgh delivery. Heavy Melting Stock is firm at $22 in gross tons, Car Wheels being $21.75 to $22 in gross tons Cast Iron Borings are $19.50 to $19.75, gross tons, and No. 1 Busheling Scrap $18 in net tons and Wrought Iron Turnings about $14 in net tons.

The Monarch Iron & Steel Company, composed of George W. Jope and W. Perry Lemley, have opened offices in Room 510, Bijou Building, Pittsburgh, as Iron merchants and special agents, and will make a specialty of handling Structural Iron and Steel Plates, Bars, Shafting, Rails, Forgings, Castings, &c., for prompt delivery. The concern are also general sales agents for Shafting, &c., made by the Cumberland Steel Company, at Cumberland, Md.

St. Louis.

CHEMICAL BUILDING, October 8, 1902.—(*By Telegraph.*)

Pig Iron.—Little new inquiry shows in the market for Pig Iron, and the difficulty confronting the sales departments at this point is to keep their customers supplied with material now under contract. This seems to be a proposition that is becoming harder and harder to successfully carry out, as the new strike feature in the Southern district, coupled with the scarcity of fuel in other sections, will compel the shutting down of more of the furnaces. Every bit of Iron that comes to this market is required for actual consumption, and any curtailment will necessarily work hardship among the manufacturers. We quote f.o.b. for 1902 as well as 1903 delivery as follows:

Southern, No. 1 Foundry	$23.25 to $23.75
Southern, No. 2 Foundry	22.75 to 27.75
Southern, No. 3 Foundry	22.25 to 24.25
Southern, No. 4 Foundry	21.25 to 23.75
No. 1 Soft	23.25 to 25.15
No. 2 Soft	22.75 to 25.75
Gray Forge	21.75 to 24.75
Southern Car Wheel Iron	21.75 to 24.75
Malleable Bessemer	21.75 to 24.75
Ohio Silvery, 8 per cent. Silicon	.... to ....
Ohio Strong Softeners, No. 1	.... to ....
Ohio Strong Softeners, No. 2	.... to ....

Bars.—Iron and Steel Bars are in fair demand from the jobbers, but the volume of business has hardly come up to expectations expressed earlier in the season. We quote from the mills: Iron Bars at 1.85c. to 1.95c., and Steel Bars at 1.80c. to 1.95c. Jobbers quote Iron Bars at 2.25c., and Steel Bars at 2.25c.

Rails and Track Supplies.—Some considerable new business is steadily showing in the market for Rails and Track Supplies for the next year, and in the matter of material for early delivery the same old condition of scarcity continues to prevail. We quote as follows: Splice Bars at 2.10c.; Bolts, with Square Nuts, at 3c. to 3.10c.; Hexagon Nuts, 3.25c. to 3.30c., and Spikes at 2.50c. to 2.60c.

Angles and Channels.—The movement of Angles and Channels through the jobbers is in fair volume, and in the matter of price the same quotation is general. For material of this class 2.50c., base, from store is asked.

Pig Lead.—Prices show firmness in the market for Pig Lead, but there is little improvement in the demand. Chemical at 4c. to 4.02½c., and Desilverized at 4.05c.

Spelter.—Consumers have about taken all of the supply of spot material from the smelters, and it is said to be a difficult matter to fill any additional large requirements for the present month. Future supplies are being well taken up, and 5.25c. is asked at this time.

Iron and Industrial Stocks.

The stock market has been adversely affected for the past two weeks by the stringency in money, which has caused continuous declines in the prices of railroad stocks as well as industrials. Quotations on some of the industrial stocks were forced to a low point during the past week, and those which have recently been boomed the hardest have suffered the most. Sloss-Sheffield common stock at one time touched 50. Dominion Steel Company, at Boston, was quite a serious sufferer from the downward tendency, and it also touched 50, which is a decline of about 30 from the high point reached a few weeks since. United States Steel has been well sustained, due probably to the excellent earnings of the constituent companies.

The annual meeting of the stockholders of the Crucible Steel Company of America of Pittsburgh will be held October 15, at Jersey City, N. J., for the purpose of electing a Board of Directors and receiving and acting upon the reports of officers. Candidates for re-election: Reuben Miller, Frank B. Smith, Andrew W. Mellon, Charles E. Clapp and Wm. H. Singer.

On October 1 J. P. Morgan & Co. paid another installment to the underwriting syndicate of the United States Steel Corporation. This installment was $10,000,000, making $40,000,000 total profits up to the present time. It is reported that the members of the syndicate will probably receive $15,000,000 more, but the managers alone are able to name the exact amount.

The net profits of the International Smokeless Powder Company, one-sixth of whose $600,000 outstanding preferred and 51 per cent. of whose $9,000,000 common stock are owned by the Marsden Company, are reported by the company as being nearly $120,000 for eight months, or about three times a year's dividend on the preferred stock.

A mortgage of $7,500,000 has been given by the Pennsylvania Steel Company to the Girard Trust Company, Philadelphia, to secure 5 per cent. gold bonds of an equal amount.

The discharge of the receiver of the New England Gas & Coke Company and the listing of the new Massachusetts Gas Companies' securities on the Boston Stock Exchange are taken as a declaration that the whole plan of reorganization of the New England Gas & Coke Company and practically of the entire Boston field has been successfully carried through. There will be no foreclosure sale of the property of the New England Gas & Coke Company, merely an agreement between the trustees of that company and of the Massachusetts Gas Companies, by which an outright sale is arranged for. The bonds and stock of the old company are exchanged for stock of the Massachusetts Gas Companies.

The annual meeting of the Westinghouse Air Brake Company was held at Wilmerding on the 7th. The report shows gross earnings exceeded $8,550,000, an increase of $689,646 over those of the preceding year, while net earnings furnished a gain of $445,949. The net profits totaled $2,928,965, or about $290,000 in excess of the dividends paid, which were at the rate of 24 per cent. on the $11,000,000 capital. The following directors for the ensuing year were elected: George Westinghouse, president; Robert Pitcarn, H. H. Westinghouse, John Caldwell, E. M. Herr, W. W. Card and Henry Oliver.

Dividends.—The American Shipbuilding Company have declared a quarterly dividend of 1 per cent. on the common stock, payable December 1. This is the initial dividend on the common shares.

The Wheeling Natural Gas Company and the Ohio Valley Gas Company of Wheeling, W. Va., have each declared a regular quarterly dividend of 2½ per cent., payable October 18.

The Philadelphia Company of Pittsburgh have declared a regular quarterly dividend of 1½ per cent. on the common stock, payable November 1.

The Allegheny Heating Company of Allegheny, distributors of natural gas, have declared a quarterly dividend of 3 per cent., payable November 1.

The Harbison-Walker Refractories Company of Pittsburgh have declared a quarterly dividend of 1½ per cent. on the preferred stock, payable October 20. The disbursement will amount to $120,000, there being $8,000,000 of the stock. Next month stockholders will vote on a proposition to increase the total capital issue to $27,600,000.

The Union Steel Casting Company of Pittsburgh have declared the usual quarterly dividend of 3 per cent. on the stock.

The Standard Underground Cable Company of Pittsburgh have declared a quarterly dividend of 2 per cent.

The American Window Glass Company of Pittsburgh have declared a dividend of 1½ per cent. on the common stock, payable October 15.

September Fluctuations in Iron Stocks.

The following table shows the extent of transactions and the fluctuations in quotations of the stocks of iron and steel companies in the month of September, with the dates on which the highest and lowest prices on each stock were realized:

Cap'l Issued.		Sales.	High-est.	Date. Oct.	Low-est.	Date. Oct.
$17,701,500	Am. Bicycle Co., com.	41,800	3¼	2	1¼	30
9,294,900	Am. Bicycle Co., pref.	3,500	16	3	5	24
9,500,000	Am. Bicycle Co., bonds.	271,100	60	5	45	29
41,233,300	Am. Can, com.	8,650	14½	6	12½	30
41,233,300	Am. Can, pref.	6,660	54½	18	52	30
29,000,000	Am. Car & F'dry, com.	52,800	37	26	34¼	3
29,000,000	Am. Car & F'dry, pref.	7,700	92¼	3	89⅞	29
24,100,000	Am. Loco., com.	43,550	34	3	29⅝	24
25,000,000	Am. Loco., pref.	13,900	97⅞	19	93	24
15,000,000	Bethlehem Steel.	....	..	..	..	..
45,000,000	Cambria Steel.	56,922	29⅛	23	27½	13
7,000,000	Cent. Foundry, com.	5,000	4⅜	26	2	4
7,000,000	Cent. Foundry, pref.	1,200	15	26	11½	14
17,000,000	Colorado Fuel & Iron.	162,800	83½	2	76½	29
25,000,000	Crucible Steel, com.	34,000	24	30	21¼	4
25,000,000	Crucible Steel, pref.	31,000	88	10	85	30
1,975,000	Diamond State Steel.	2,250	1⅝	23	1½	30
2,368,100	Empire I. & S., com.	2,800	15	27	9	6
2,281,400	Empire I. & S., pref.	500	50	4	47	30
10,000,000	Geo. A. Fuller, com.	3,400	62	9	60	13
5,000,000	Geo. A. Fuller, pref.	1,000	105	4	104½	18
15,000,000	Inter. Pump, com.	1,800	53½	2	48	24
8,850,000	Inter. Pump, pref.	600	92¾	8	92¾	8
11,000,000	International Silver.	7,500	23	25	17	2
8,396,000	Natl. Enam., com.	5,000	39	11	36¼	24
15,441,800	Natl. Enam., pref.	700	95	10	85	29
4,449,800	Otis Elevator, com.	3,600	44½	10	41	27
6,350,000	Otis Elevator, pref.	750	105	15	99	25
10,750,000	Pa., new, com., Phila.	2,200	50	30	47	24
16,500,000	Pa., new, pref., Phila.	1,650	103	8	100	30
12,500,000	Pressed Steel, com.	65,100	57	30	51	3
12,500,000	Pressed Steel, pref.	18,500	91½	29	88	24
10,000,000	Railway Spr., com.	37,000	38½	19	32	5
10,000,000	Railway Spr., pref.	9,000	90	2	87	16
27,191,000	Rep. I. & S., com.	159,000	24¾	8	20	24
20,306,900	Rep. I. & S., pref.	37,100	83¾	10	78⅞	25
7,500,000	Sloss-Shef. S. & I., com.	53,000	83	5	65	2
6,700,000	Sloss-Shef. S. & I., pref.	3,600	95½	9	91⅛	2
20,000,000	Tenn. Coal & Iron.	132,600	71⅞	10	63½	29
1,500,000	Tidewater Steel.	200	7	2	6½	26
12,106,000	U. S. C. Pipe, com.	57,400	16⅞	2	12½	3
12,106,000	U. S. C. Pipe, pref.	29,700	59	6	46	4
510,361,300	U. S. Steel Co., com.	606,300	42¾	4	38¾	29
508,511,200	U. S. Steel Co., pref.	175,000	92	20	87½	29
8,425,000	Virg. I. & C., com.	32,500	37	30	21	2
10,000,000	Virg. I. & C., 5% bonds.	132,500	84	11	77	23
1,500,000	Warwick I. & S.	2,100	6⅞	8	6½	30

Alabama Steel & Wire Company's Steel Plant.—The Garrett-Cromwell Engineering Company of Cleveland, Ohio, who are consulting engineers and who have drawn plans for the new open hearth steel plant to be erected by the Alabama Steel & Wire Company, at Birmingham, Ala., have placed most of the important contracts. The contract for the main building has been let to the Riter-Conley Mfg. Company of Pittsburgh. The blooming mill building, boiler house, gas producer house, stripping building, &c., will be erected by the Forest City Iron & Steel Company of Cleveland, Ohio. The plant will contain four 50-ton basic furnaces and about 2500 tons of structural steel will be used in the buildings, which will be furnished by a Pittsburgh mill. For binders of the furnaces 200 tons of foreign shapes have been bought.

The Singer Mfg. Company of New York and Elizabeth, N. J., it is said, will produce their own pig iron and finished product. According to reports, about which they refuse to give any information, they have purchased the furnace and mines of the Musconetcong Iron Works at Stanhope, N. J., and will erect a rolling mill, to be operated in connection with the stack. The furnace has an annual capacity of 35,000 tons.

New York.

NEW YORK, October 8, 1902.

Pig Iron.—Very little domestic Pig Iron is to be had for delivery this year. Consumers throughout the East are buying foreign Pig Iron in small lots for early delivery, and paying from $23 to $25 per ton. The business done in this way amounts to quite a large volume, full cargo lots being regularly purchased by commission merchants for the trade. The demand is due to the fact that foundrymen are unable to get enough Iron from the furnace companies with whom they have contracts. While the foundries are badly hampered for lack of Coke and are paying very high prices for such supplies as they can secure they are endeavoring to continue operations, hoping that conditions may speedily change. The outlook, however, is decidedly unfavorable if the supply of Coke from the ovens does not speedily become larger so that prices will once more be reasonable. For delivery in 1903 the following quotations are made: Northern Iron, at tidewater, No. 1 X, $23.25 to $24.75; No. 2 X, $22 to $22.75; No. 2 Plain, $21 to $21.75. Tennessee and Alabama brands, in New York and vicinity: No. 1 Foundry, $23.25 to $23.50; No. 2 Foundry, $22.25 to $22.50; No. 3 Foundry, $21.50 to $22.

Steel Rails.—Manufacturers report a sustained demand for delivery the latter part of next year. The mills are sold up through August and some of them have their capacity covered still further. Quotations continue at $28, Eastern mill.

Manufactured Iron and Steel.—The week has not been specially active in the line of bridge work, although some fair orders have been secured. The final order for work growing out of the elevation of the N. Y., N. H. & H. R. R. tracks at Bridgeport, Conn., amounting to 1500 tons, was placed. This particular piece of work has now taken 6500 tons. Some scattered orders for bridge work are coming in from abroad. This is regarded as an opening which promises to lead to more extensive export business. With regard to domestic work, the next three months are considered the best time for booking railroad orders for the coming year, and the bridge builders anticipate a very good volume of business of that character. The demand for Structural Material for building purposes is excellent, with continued purchases of foreign Beams and Angles reported. Quite a steady business is being done in lots of about 500 tons. The foreign manufacturers are able to land material at this port within four to six weeks from the receipt of specifications. Prices on foreign Beams are 1.80c., duty paid, New York, and on Angles, 1.90c. The demand for other classes of Iron and Steel products keeps up very well. We quote, at tidewater, as follows, but for small lots and prompt delivery much higher prices are being obtained for Structural Material and for Plates: Beams, Channels and Zees, 2c. to 2.25c.; Angles, 2c. to 2.25c.; Tees, 2c. to 2.25c.; Bulb Angles and Deck Beams, 2.10c. to 2.25c. Sheared Steel Plates are 2c. to 2.10c. for Tank, 2.10c. to 2.20c. for Flange, 2.25c. to 2.40c. for Fire Box. Refined Bars are 1.95c. to 2c.; Soft Steel Bars, 1.95c. to 2.10c. Foreign Beams are 1.80c. and Angles 1.90c., ex-ship, New York, in 500-ton lots or greater.

Old Material.—The market is quiet. The mills in the East are buying very little and will not increase their purchases until the labor troubles in some of the leading works are settled. By far the larger part of the material for rolling mill consumption now moving is being shipped to the West. The demand for Scrap from the foundries is fairly active. Selling quotations are as follows, per gross ton, f.o.b. cars in this vicinity:

Old Iron Rails	$22.50 to $24.00
Old Steel Rails, long lengths	22.00 to 23.00
Old Steel Rails, short pieces	19.00 to 19.50
Relaying Rails, heavy sections	29.00 to 30.00
Relaying Rails, lighter sections	34.00 to 35.00
Old Car Wheels	20.50 to 21.50
Old Iron Car Axles	27.00 to 28.00
Old Steel Car Axles	26.00 to 27.00
Heavy Melting Steel Scrap	19.00 to 19.50
No. 1 Railroad Wrought Scrap Iron	22.00 to 23.00
Track Scrap	20.00 to 21.00
Busheling Scrap	15.00 to 16.00
No. 1 Machinery Cast Scrap	19.00 to 20.00
Stove Plate	13.00 to 14.00
Wrought Turnings, delivered at mill	16.50 to 17.50
Cast Borings, delivered at mill	10.00 to 10.50

Metal Market.

NEW YORK, October 8, 1902.

Pig Tin.—While in the middle of the week under review there was a slight rally in prices coming from London values have since declined again and the week shows a considerable shrinkage in values as compared with last week. Until last Saturday the market had declined to 25.10c. for spot. Then the reaction set in which brought the price up to 25.30c., and to-day values had slid back to the following levels: Spot to October, 25c. to 25.25c.; November, 24.65c. to 25.05c.; December, 24.60c. to 24.87½c. London closed £115 5s. for spot and £114 5s. futures. Business has not been active, consumers buying from hand to mouth. Engagements for future delivery have been small on account of the small discount now existing. Arrivals here so far this month amount to 435 tons and there are about 2309 tons afloat.

Copper.—The market remains as quiet as ever. Buyers and sellers stand apart awaiting developments and in the meantime introduction is going on on a large scale, while consumption, it is said, is not as good as heretofore. Exports this month have thus far amounted to about 3600 tons. At the close to-day the market was quite unchanged from last week as to the values of Lake. Other brands were a shade off. For spot to December delivery we quote: Lake, 11.55c. to 11.75c.; Electrolytic, 11.40c. to 11.50c.; Casting, 11.37½c. to 11.50c.; Standard, 11.60c. to 11c. The London market had declined from last week to £51 18s. 9d. for spot, and £52 3s. 9d. futures. Best Selected is unchanged at £55 10s.

Pig Lead—Is absolutely without change. The Smelting & Refining Company quote Desilverized on a basis of 4.12½c. for spot and 4.10c. futures, New York. London is still £10 15s. There has been no announcement as yet by the National Lead Company regarding their new consolidation.

Spelter.—In addition to the fact that spot is firmly held by manipulators, it is now said that there is really a scarcity of spot. In this market spot is still held nominally at 5.50c. Shipments from the West are quoted 5.37½c. to 5.42½c., and St. Louis quotes 5.20c. to 5.25c. London has advanced to £19 17s. 6d.

Antimony—Is unchanged. Hallett's is quoted 7¾c., Cookson's 9½c., and other brands 7¼c. to 7½c.

Nickel.—No change is noted. Large quantities down to ton lots are now quoted at 40c. to 47c. per lb., according to size and term of order. Smaller lots are quoted as high as 60c., according to quantity.

Quicksilver.—The market is quiet and unchanged, the ruling quotations being $48 per flask of 76½ lbs., each in lots of 50 flasks or more. London is unchanged at £8 15s.

Tin Plates.—The market is dull and uninteresting, with an absence of any important buying. Prices are without change. The American Tin Plate Company are quoting for delivery up to December 1 on the basis of $4.19 per box for Standard 100-lb. Cokes, f.o.b. New York, or $4, f.o.b. Pittsburgh. The market at Swansea has further declined 1½ pence to 12 shillings.

The New York Machinery Market.

NEW YORK, October 8, 1902.

No disturbing elements have as yet shown themselves in the machinery trade and business continues at a brisk pace. The excellent demand is still centered in the machine tool trade, where orders large and small continue to accumulate, leaving the builders no chance to catch up on deliveries. Portions of the long lists recently issued by large purchasers and still undecided upon, together with the heavy new inquiry, furnish every indication of continued prosperity in the machinery trade for some time to come. That prices have been advanced all along the line is fortunate for the manufacturers, as purchasers are not standing over price in the least. The present activity is going along on the basis of the higher values. As an illustration of the cheerfulness of machinery men over present conditions a machine tool builder, who advanced prices as a result of the recent Niagara Falls meeting, stated: "Why, orders have been more frequent since we advanced prices than they were before." When asked whether the Cleveland meeting of the National Machine Tool Builders' Association intended to rescind their action at Niagara Falls, he said that the recent coming together of machine tool builders was the best thing that ever happened to that branch of the trade and that he believed that the Cleveland meetings on next Tuesday and Wednesday will mark a distinct stride in the further unifying of the interests which have seen the benefits of the organization. Similar interest is expressed throughout the machine tool trade in the Cleveland meeting, and judging from the enthusiasm expressed hereabouts, the attendance from the East will be large.

The convention of the Southern Supply and Machinery Dealers' Association has been postponed. The dates now decided upon for the meeting are November 12, 13 and 14. In a statement which Secretary-Treasurer C. B. Carter has just issued, besides stating the fact that several other conventions will be in session at Memphis on the same dates originally selected by the association, he says: In view of the above conditions, which would prevent our members and visitors meeting together as much as should be, also for other reasons, our Executive Committee have found it desirable and, in fact, necessary to change the dates of our meeting from October 21, 22 and 23 to November 12, 13 and 14. In the first place, it is very desirable that we secure a good representation of the manufacturers. This can be best accomplished by changing the dates to November 12, 13 and 14 for the reason the National Hardware Association will hold its annual convention in New Orleans on November 19,

20 and 21, and a very large number of manufacturers will accordingly attend. By having our meeting the week preceding that of the National Hardware Association the manufacturers can first come to Memphis and meet with us and afterward go on to the New Orleans meeting, thus making both trips with no great expense or loss of time. In case our meeting was held in October many of the manufacturers could not afford to attend both conventions, especially when the manufacturers were located far distant. For these reasons many of the manufacturers whom we are anxious to have with us at Memphis could not attend, on account of their having made previous arrangements to attend the New Orleans convention. From the investigations which we have made we believe this change of dates will prove equally as desirable to our members as to the manufacturers."

In connection with the several large propositions in the machine tool trade regarding which we have kept our readers informed lately there is still a good quantity of machinery to be purchased by the Baldwin Locomotive Works. The General Electric Company have also a fair sized amount to purchase in connection with their new turbine shop. The Pennsylvania Railroad now have their list ready. It is in the hands of Purchasing Agent Newhall at Philadelphia. The purchases on this account will aggregate about $150,000. The tools are for the Juniata shops, which are on the outskirts of Altoona, Pa. These tools, we understand, are soon to be purchased, and consequently there will be no necessity for an annual list in 1903. For the shops at Altoona proper the usual annual list is being compiled and purchases will be made in 1903.

The Lehigh Valley Railroad have decided to enlarge their shops at Sayre, Pa., and will soon purchase about $60,000 worth of machine tools for equipping them. J. H. Vought, assistant superintendent of motive power, whose offices are at South Bethlehem, Pa., has the entire proposition under his charge.

In the engine, boiler and power station supply trade there is a little complaint to be heard among smaller merchants, but producers of large units are as busy as can be and are confronted by several very large projects which will soon require equipment. Plans are being prepared for two big electric plants which it is estimated will require at the outset about 80,000 horse-power of generating apparatus each. They are for the new station to be built by the New York Central & Hudson River Railroad in connection with the electrical operation of the Grand Central tunnel and by the Pennsylvania Railroad for their North River tunnel. The former project is entirely in the hands of the engineering department of the New York Central Railroad. Westinghouse, Church, Kerr & Co. are doing the engineering on the Pennsylvania's tunnel.

Another large electric plant will be built by the New York & Port Chester Electric Railway. We are advised that this concern intend adopting the turbine generator. The plant, it is expected, will be between 20,000 and 30,000 horse-power. C. O. Mailox, electrical engineer, of 76 William street, is preparing the plans for this statien.

Owing to the long deliveries named by builders of heavy engines the turbine generator is reaping considerable benefit. We hear of a number of concerns who intended installing large reciprocating engines who have just changed over and are now going to use turbines instead. Such action is growing a distinct boom to this new industry, and it is needless to state that each of the few concerns who have taken up the building of the apparatus is straining every effort to facilitate production.

One of the largest recent orders was placed by the Port Huron Light & Power Company of Port Huron, Mich. They have just ordered a 1500-kw. Curtiss turbine generator from the General Electric Company. They have also placed an order with the Alberger Condenser Company of 95 Liberty street, New York, for a high vacuum system of surface condensers, to be operated with the turbine plant. The latter company also booked an order for 12,500 horse-power of barometric condensers, to be operated in connection with the new blast furnace plant of the Sharon Steel Company of Sharon, Pa. Another large order for barometric condensers taken by the Alberger Company calls for 6000 horse-power for the Hartford Street Railway Company of Hartford, Conn.

C. E. Roehl, engineer power and electrical transmission for the Brooklyn Heights Railroad Company, Brooklyn, N. Y., advises us in regard to the proposed sub-station on Sand street, between Washington and Adams. It is the intention of the company to construct a combined rotary and battery sub-station at this point which will contain a 6000-kw. rotary capacity. It will be built of brick and steel and it is intended to proceed with the construction immediately.

The Hartford Carpet Corporation, who are to build at Thompsonville, Conn., have closed on their power plant equipment. They have purchased 2000 horse-power of Cahall water tube boilers from Thayer & Co. The engine order went to the International Power Company of Providence, R. I. The Green Fuel Economizer Company of 74 Cortlandt street received the order for fuel economizers.

The Windsor Machine Company of Windsor, Vt., have bought all the patents, both domestic and foreign, for the Gridley automatic turret lathe, which they have heretofore manufactured on royalty. They intend continuing the manufacture of this machine in an increased number of sizes and will add extensively to their plant to facilitate a greater production.

The Reeves Engine Company, 85 Liberty street, New York, are in the market for a 48-inch lathe, large drill press and some other tools.

Announcement is made of the fact that the Cleveland Machine Screw Company of Cleveland, Ohio, have been succeeded by the Cleveland Automatic Machine Company. This change has been made to better harmonize the name with the character of product turned out. The opinion has prevailed that the company were engaged in the manufacture of screws and similar products, instead of automatic machines, and by the change decided upon it is hoped to eliminate inquiries for screw products. The announcement further states: "In presenting ourselves under the new title we beg to state that we have enlarged and extended our splendid facilities for automatic machine work and shall confine ourselves to the manufacture of high grade automatic machinery. Our facilities for designing and making special automatic machines cannot be surpassed, and inquiries in that line will receive most careful attention."

The following announcement has been sent out to the trade by the Grant & Harper Machinery Company, Park Row Building, New York: "We beg to advise you that the machinery department of Grant & Williams, Andrew Harper, manager, will on and after October 1, 1902, be transferred to the Grant & Harper Machinery Company, who will carry a full line of steam shovels, locomotives, cars, relaying rails and contractors' material of all kinds."

Percy G. Smack has opened offices at 95 and 97 Liberty street, New York, under the name of the Clinton Foundry & Machine Company, where he will receive orders for furnace, machinery and building castings. Among the specialties he will handle are grate bars and the Smack arch.

WASHINGTON, D. C., October 7, 1902.—The Bureau of Yards and Docks of the Navy Department after nearly a month's consideration of the proposals opened on September 9 for certain machine tools, motors, steel tubing, &c., for the navy yard at Portsmouth, N. H., have made the following recommendations:

Class 1, 2850 feet cold drawn steel tubing for conduits, no award.

Class 2, 500 feet electric light cable, no award.

Class 3, one lot electric junction boxes, switch boxes, &c., no award.

Class 4, 4200 feet soft drawn copper wire, no award.

Class 5, one lot cast iron pipe fittings, Manhattan Supply Company, $512.52.

Class 6, one rock crushing plant, including portable rock crusher, elevator screen, etc., Acme Road Machinery Company, $1075.30.

Class 7, one 35 horse-power, one 15 horse-power and one 3 horse-power, 220 volt, direct current, slow speed motors, no award.

Class 8, one No. 2 universal milling machine, Becker-Brainard Milling Machine Company, $775.

Class 9, one iron planer, 24 by 24 by 8 feet, Manning, Maxwell & Moore, $615.

It is understood that the items as to which no awards are recommended will be readvertised. W. L. C.

One result of the coal strike has been to boom the gas and oil stove trade. The demand for both of these has always been remarkably steady, particularly in the East, and manufacturers are not equipped to meet the present condition. Neither oil nor gas stoves can be had in any quantity and dealers find it impossible to replenish stock.

John McConnell, who was formerly connected with the iron and steel mills at Birmingham, Ala., has been appointed to the position of superintendent of the steel works of the American Steel Casting Company of Chester, Pa.

In September the Vandergrift unit, embracing sheet mills of the American Sheet Steel Company at Vandergrift, Hyde Park, Saltsburg and Leechburg, shipped 12,738 net tons of black and galvanized sheets. This large shipment was made in face of the fact that cars and motive power were short all through the month, and had there been adequate shipping facilities the above works would have shipped out at least 17,000 tons. The largest shipment of sheets in any one month of the Vandergrift unit was in May, 1902, when 16,581 net tons of black and galvanized sheets were shipped out by the four works named above.

Cincinnati Machinery Market.

CINCINNATI, OHIO, September 30, 1902.

The general situation in iron consuming circles in this city is one of intense activity. The machine shops are more than normally busy and running about to the extent of their capacity, though perhaps a little short of good machinists, who are reported rather scarce in the field. The city at large is improving in a manner, and at a rate not known for years, and almost every week a proposition to replace more of the old time-worn structures with modern steel buildings is being discussed. The latest in that line which is likely to materialize at anything like an early date is the building which the First National Bank is proposing to build on the southeast corner of Fourth and Walnut streets. The lot on which this building is to go up is a large one, and the building will be, if preliminary reports are to be depended on, as large and as high and as elaborate as anything that has yet been erected here. M. E. Ingalls, president of the Big Four Railway, is now putting in the foundation on the northeast corner of Fourth and Vine streets for a building of steel and concrete construction, which will be the first of its kind anywhere in this section of the country. These buildings have been erected at widely scattered points in the East and possibly at Chicago, and in one or two instances where they have been attacked by fire have proved their resisting qualities in a way that has been a marvel to underwriters; consequently the proposition to erect one of this class here carries with it more than ordinary interest.

The constructive movement in machine tool circles is just as great, apparently, as it has been at any time, and at this date there is a constant talk of this or that shop building or moving out to larger and more commodious quarters or else enlarging the ample shop constructed within the last half dozen years, notably at this time, the extensive additions to the Schumacher & Boye shops on Queen City avenue, where they are probably increasing their capacity to the extent of 25 to 50 per cent. Also it is understood that the Lane & Bodley Company, who have been for years desiring and talking about the advisability of erecting shops on property they own at Bond Hill, have at last commenced the work of the erection of a building 120 feet wide by 300 feet long. Then in addition to this they are to have a building for pattern storage, a power plant, wood shop and a building for the cleaning of castings. They expect to have the new plant in pretty good shape by the first of the year, and will probably take possession of it early in 1903. They are now understood to be in the market for complete foundry equipment.

Not far from the Lane & Bodley shops will be the new Fay & Egan plant, upon which the expenditure of $500,000 has already begun.

The Cincinnati Machine Tool Company, manufacturers of upright drills, report a good, active, healthy condition of business, shops full busy, with orders well distributed from all sections of this country. They also inform us that there has been a very material increase in their foreign trade, recent orders having been received from England, France, Belgium, Switzerland, Italy, China and Cuba. Germany and Russia are not very much in evidence now, as far as the order book is concerned. The outlook for a good fall and winter trade is first class.

Greaves, Klusman & Co. are having an excellent trade from domestic sources. They make both iron and wood working tools, and report both branches as unusually active. They have just increased their equipment by the addition of a 125 horse-power Greenwald engine. They are among the very few machine tool makers in Cincinnati who had exhibits at the Fall Festival and Industrial Exposition which has just closed.

Dreses Machine Tool Company report a nice increase in foreign orders, and say that trade with Italy, England, Holland and Sweden has been very good and appears to be on the increase. They have just added to their equipment by the purchase of four or five large machine tools and in every way are feeling the effects of activity.

The American Tool Works Company are running to their fullest, and at present are making a specialty of motor driven lathes, planers and drilling machines. They are also redesigning a number of their tools and constantly improving their outfit. They also notice quite a revival in foreign trade, and regard the general outlook as very good.

The Lodge & Shipley Machine Tool Company have nearly completed extensive improvements and additions mentioned in a prior issue of *The Iron Age*. They are now building a tramway connecting the different parts of their plant, upon which they will operate motor driven trucks to facilitate the handling of castings and finished tools. The new electric crane, which will run the entire length of their main building, will soon be ready for operation. One of the best things in the way of construction which they are introducing is a new speed variator, which in many cases will double the capacity of the tools to which it is applied.

The Cincinnati Milling Machine Company report excellent business, and the outlook for its continuation most promising. They also regard the outlook in the foreign field as good, and note an increase in the number of orders which are coming in.

The Lane & Bodley Company have just shipped two large Corliss engines, one 26 x 72 and one 28 x 72, to the American works of William Jessup & Sons of Sheffield, England. The engines go to Washington, Pa., for installment in their new steel plant at that point.

The J. M. Robinson Mfg. Company, makers of sheet metal forming machines and bending machinery, have just shipped a machine weighing 35,000 pounds for bending plates a ¼ inch thick and 10 feet long. This is the largest machine ever sent out of their shop. They report business exceptionally good, with plenty of orders on their books and the prospects of an excellent fall and winter season.

The John H. McGowan Company have been quite successful in the receipt of orders, and have now enough on their books to keep them running to the first of the year. Among the recent orders for municipal water works which they have taken are the pumping machinery for the Piqua plant, for Columbus Grove, for Paulding and for Westerville, all in Ohio, these pumps aggregating about 10,000,000 gallons capacity. They have recently received an order from a point in Mexico for about three carloads of pumping machinery.

The Hoefinghoff & Laue Foundry Company report that they are finding orders more than they can handle at their Cincinnati and Norwood shops combined. The Norwood plant, which was only recently completed, is already proving too small, and they are now contemplating enlarging the foundry according to the original plans. This will just double the present size. When the plant was built it was expected that it would be ample to take care of the business for several years to come. The only adverse feature of the situation is the difficulty in securing coke and iron for their contracts.

The Stewart Iron Works are very busy at both their Covington and Cincinnati shops, and they are now preparing to erect a three-story brick building on lower Madison street, Covington, which will be 120 x 250 feet in size, to which they expect to move their fence shops, thus giving them more room at their present quarters for the jail and other architectural iron work which they undertake.

Smith, Myers & Schmier, who make a specialty of saw mills and engines, are very busy at this time, and report a good active trade from Southern and Southwestern points especially. They have also recently received orders for two veneer mills and a complete outfit for a large band saw mill for a Western city.

The Warner Elevator Company have recently shipped two carloads of elevator machinery to the Brooklyn Navy Yard, and also five electric passenger elevators to the Herter Block, New York City. They report as a development in their business that electric elevators are rapidly taking the place of hydraulic. They have at the present time over 60 electric elevators in process of construction in their shops.

Contract for Large Ore Handling Plant.

The Wellman-Seaver-Morgan Engineering Company of Cleveland, Ohio, have received the contract for the complete construction of the ore handling plant for the Union Steel Company's large blast furnace at Donora, Pa. This plant will be a radical departure from anything that has hitherto been done in ore storage and handling plants for large blast furnaces. All of the ore, both in the storage stock piles and in the bins, will be housed and protected from the weather and arranged so that in the winter, by means of artificial heating, the temperature will not be less than 45 degrees. Frozen ore, in more ways than one, is very expensive to handle. It costs more to get it to the furnace and it costs more to handle it when it gets there. The new arrangement will enable the blast furnace to be charged uniformly the year round, which will tend to increase the capacity very materially.

In general, the plant will consist of an immense stock house, 240 feet wide in the clear, 70 feet high underneath the roof trusses, and long enough to store 400,000 to 500,000 tons of ore and sufficient coke and limestone for the operation of the plant. The ore is brought from the lake ports to the stock house and dumped either directly from the cars into the bins or transferred directly to the stock piles. The plant is to be equipped entirely with electrically operated machinery.

Slackness in the British shipbuilding trade has resulted in the closing of the plate department of the South Durham Iron Works, which has thrown 1200 men out of work.

Central Pennsylvania News.

HARRISBURG, PA., October 7, 1902.—The situation in this part of the State has not improved, and if fuel conditions are not bettered within a few weeks there will be several suspensions. Large works are unable to make their products under present conditions and frequent suspensions have been necessary.

Comparatively few orders have been placed because of unsettled conditions, and iron and steel men are wondering what will be the order of the winter when the cold weather adds to the difficulty of obtaining fuel. Heavy loss faces some establishments.

In this city the mills ran pretty regularly during September, but the product was limited. The Harrisburg Foundry & Machine Works and the Central Iron & Steel Company's plant were held back by scarcity of material, and the Central Company have bought largely of foreign iron and steel. The Pennsylvania Steel Company have had trouble to keep up the coke supply for their furnaces, and one has been blown out for repairs. The rail and other rolling mills at the works have been retarded by the inability to procure material and fuel. The orders for this year are being worked up as fast as possible, and the new departments have been partially occupied.

Lebanon's labor troubles seemed to reach a lull last week when the American Iron & Steel Mfg. Company closed their puddle and finishing mill and the soldiers were withdrawn. Other plants in Lebanon are working well considering the strike conditions, but the furnaces have been compelled to stop occasionally because of failure of coke. No. 2 Colebrook is idle for repairs.

York and Lancaster counties and the Juniata Valley are in about the same condition as last week. Centre County furnaces are working well, and the Bedford region is a busy place.

The Temple Iron Company will make a number of repairs and improvements to their furnace near Reading. Berks County furnaces are generally idle because of the anthracite strike.

Tidewater Steel Company have shut down their furnace at Chester for lack of coke, several days having been lost last week. Chester Steel Works share the difficulties of those in other places, and there are many orders which have been delayed because of the trouble over fuel.

The Reading Fire Apparatus Works turned out their first chemical engine last week. The machine weighs 900 pounds and has two 35-gallon tanks with recharging apparatus.

A new phase of the labor situation turned up in Waynesboro last week, when the Geiser Mfg. Company posted a notice that after October 6, when the works will resume after stock taking, no union men would be employed. The Frick Company followed their example, and both plants will be nonunion, although a lodge of machinists was only recently organized in that place. The Landis Tool Company, Smith Company and Emmert Company have not acted yet.

The steel structure for the new foundry of the Diamond Drill & Machine Company, at Birdsboro, is being erected by the McClintic-Marshall Construction Company of Pottstown.

The Reading Coal & Iron Company have commenced to abandon some of their mines and the machinery is being removed. Last week the iron was taken out of the Richardson colliery in the Heckshersville Valley region.

The contract for Pennsylvania's new capitol in this city was let on Thursday by the commission to Payne & Co. of Philadelphia, who will begin work at once. The price was under $3,500,000, and was scaled down from the original bid. It is calculated to have the great building completed within 34 months. A vast amount of material will be required, as the present building, a temporary structure at best, built at a cost of over $250,000 in 1898, will be partially reconstructed and two huge wings will be built. The capitol will be fire proof in every way.

The following iron and steel companies were granted letters of incorporation by the State of Pennsylvania in September:

The Sheet Steel Company, Pittsburgh; capital, $50,000. Directors: J. C. Painter, C. C. Ross, George A. McLean, W. O. Bollinger, Pittsburgh, and Nelson McVicker, Tarentum.

Keystone Pattern & Foundry Company, Evans City; capital, $12,000. Directors: J. N. Ifft, T. M. Maxwell, J. N. Maxwell, C. G. Lotz, Evans City, and F. J. Flacker, Bellevue.

Union Chain & Forge Company, Ellwood City; capital, $100,000. Directors: C. M. Goodfellow, Andrew Kugeman and R. A. Todd, Ellwood City.

Glen Mfg. Company, Ellwood City; capital, $11,000. Directors: John W. Offitt, J. S. Richardson, H. P. Richardson, R. A. Todd and Andrew Kugeman, Ellwood City.

Mathews Woven Wire Fence Company, Pittsburgh; capital, $1000. Directors: J. C. Bily, Allegheny; S. M. Langdon and F. A. McKenny, Pittsburgh.

Pittsburgh Tool & Drop Forge Company; capital, $10,000. Directors: W. F. Schleiter and E. L. Maxwell, Pittsburgh, and E. D. Fulton, Uniontown.

The Claysville Foundry & Mfg. Company, Claysville; capital, $1000. Directors: H. H. Miller, J. W. Grimes and N. B. Brockman, Claysville.

Sligo Iron & Steel Company, Pittsburgh; capital, $1000. Directors: H. A. Davis, Osbourne; Christopher Magee, Jr., Pittsburgh, and W. W. Galbraith, Carnegie.

Standard Tin Plate Company, Pittsburgh; capital, $300,000. Directors: S. A. Taylor, S. E. Mason, Jr., and W. I. Berryman, Pittsburgh.

United Hardware & Supply Company, Oil City; capital, $500,000. Directors: S. S. Bryan and Joseph Seep, Titusville; E. D. Seep and A. F. Seep, Oil City, and C. J. Kirk, New Castle.

Crescent Steel Company, Pittsburgh; capital, $1000. Directors: J. C. Bily and H. B. Myer, Allegheny, and S. M. Langdon, Pittsburgh.

Pittsburgh Laundry Supply Company, Pittsburgh, to manufacture laundry machinery; capital, $5000. Directors: E. A. Nesbit, W. H. Nesbit and John F. Gets, Pittsburgh.

Franklin Supply Company, Franklin; capital, $50,000. Directors: G. B. Martin, A. J. Snyder, F. D. Oiler, J. L. Jackson and J. H. Thomas, Franklin.

Pittsburgh Welded Steel Package Company, Pittsburgh; capital, $1000. Directors: Milton Bartley, David Winters and B. Grubb, Pittsburgh.

Pennsylvania Fuse & Arms Company, York; capital, $1000; for the manufacture of projectiles and shells. Directors: A. J. Hershey, C. P. Watson and G. S. Schmidt, York.

Pittsburgh Pneumatic Tool & Machine Company, Pittsburgh; capital, $5000. Directors: John Charles Beckfield, H. A. Spangler and N. C. Davidson, Pittsburgh.

Erie Specialty Company, Erie; capital, $100,000. Directors: E. W. and C. L. Walker and Z. T. Bradley, Erie.

Union Spring & Mfg. Company, Pittsburgh; capital, $1000. Directors: A. E. Anderson, H. Q. Turner and J. B. Imler, Pittsburgh.

France Packing Company, to manufacture metallic packing, Philadelphia; capital, $100,000. Directors: A. W. France, C. M. Kelsey, A. J. Butterworth and J. G. Leiper, Philadelphia, and L. T. Safford, McKeesport.

The new mill of the Carpenter Steel Works at Reading has been started on double turn. The steel mill is making rolls and springs.

Potts Bros.' puddle mill and finishing department at Pottstown have started after a short shut down because of the fuel conditions. Large contracts are being turned out for Chester Tube Works.

W. F. Remppis of Reading is building the new Carbondale brewery and considerable bridge work.

No. 2 Paxton furnace of the Central Iron & Steel Company has gone into blast. All three furnaces in Harrisburg are in blast, and all but one in Steelton are working.

The Royersford Foundry are having a large rush of work, and many Eastern orders are being filled.

The Harrisburg Foundry & Machine Works have taken the contract for four engines for the new Battery Park Building in New York City. E. J. S.

The merger of several of the large textile machinery manufacturers of Rhode Island into one corporation was effected October 1, when the Textile Finishing Machinery Company, capitalized at $2,000,000, formally took over the plants and business of the Granger Foundry & Machine Company, the Thomas Phillips Company, the Phœnix Iron Foundry, all of Providence, and the Rusden Machine Company of Warren. The offices of the new company are at 19 Exchange place, Providence, R. I. The following are the officers: H. Martin Brown, president; H. A. Tillinghast, secretary and treasurer; F. I. Dana sales manager, and E. A. Rusden, general manager.

American Shipbuilding Statistics.

Record for the Past Three Months.

WASHINGTON, D. C., October 7, 1902.—The Commissioner of Navigation has compiled statistics showing the vessels practically completed and numbered by the bureau during the first quarter of the current fiscal year, embracing the months of July, August and September, 1902. The figures are unexpectedly large, but the explanation is not far to seek; and although the record for the entire fiscal year promises to be fairly satisfactory, it is not believed it will approach that of the past fiscal year, or of the year 1901, when all records since 1855 were broken.

During the quarter named 348 sail and steam vessels, with the aggregate tonnage of 103,421 gross tons, were officially numbered, as compared with 393 vessels, of 68,395 gross tons, for the corresponding quarter a year ago. About 15 per cent. should be added to these figures for both quarters to cover canal boats, barges and other small craft having neither sail nor steam power. The increase for the quarter just closed, amounting to 35,026 tons, if carried throughout the year would undoubtedly make the grand total on June 30 next in excess of any record during the past 40 years, but the bureau does not look for such a result. The total tonnage of vessels of all kinds built in the fiscal year 1902 was 473,981 tons, of which a disproportionately large amount was completed during the last quarter of the year. The shipyards were then full of work and had suffered from delays in the supply of structural steel due to the strike. As a result several large vessels, aggregating more than 32,000 tons, which would have been completed in June, 1902, were carried over and have been numbered in the quarter which ended September 30. It will be noted that this accounts for almost all of the 35,000 tons excess recorded for the quarter just closed as compared with the corresponding period a year ago.

The following table shows the steel construction during the quarter ended September 30, 1902, as compared with the same period of 1901:

	1902.				1901.			
	Sail.		Steam.		Sail.		Steam.	
	No.	Gross.	No.	Gross.	No.	Gross.	No.	Gross.
Atlantic and Gulf.	2	5,258	15	37,306	1	235	12	15,498
Pacific	....	....	1	263	..	..	..	....
Great Lakes	....	....	7	26,874	..	..	8	12,240
Western rivers	....	....	2	1,541	..	..	2	43
Totals	2	5,258	25	65,984	1	235	22	27,781

The following table shows the wood construction during the quarter ended September 30, 1902 as compared with the same period of 1901:

	1902.				1901.			
	Sail.		Steam.		Sail.		Steam.	
	No.	Gross.	No.	Gross.	No.	Gross.	No.	Gross.
Atlantic and Gulf.	143	14,962	66	2,823	174	17,756	74	6,669
Porto Rico	6	82	..	....	1	7	..	....
Pacific	23	9,206	28	2,731	14	8,272	16	2,395
Hawaii	1	6	1	7	..	....	..	....
Great Lakes	7	154	14	922	5	149	36	1,649
Western rivers	..	....	32	1,286	6	114	44	3,368
Totals	180	24,410	141	7,769	200	26,298	170	14,081

The largest steam vessels numbered during the quarter ended September 30, 1902, were as follows:

Name.	Where built.	Owner.	Gross tons.
"Harold B. Nye"	Lorain, Ohio	American Ship Building Company	4,310
"A. C. Stewart"	West Bay City, Mich	American Ship Building Company	3,943
"James H. Hoyt"	West Superior, Wis	A. B. Wolvin	3,943
"Panay"	Chicago	American Ship Building Company	3,811
"Thomas Adams"	Toledo, Ohio	Craig Ship Building Company	3,784
"Siberia"	Newport News, Va	Pacific Mail Steamship Company	11,284
"Finland"	Philadelphia, Pa	Cramp & Sons Company	12,760
"Texan"	Camden, N. J	American-Hawaiian Steamship Company	8,633
"Frank H. Goodyear"	Lorain, Ohio	American Ship Building Company	4,815

To the above should be added the steel sailing schooner "Thomas W. Lawson," of 5218 gross tons, built at Quincy, Mass., for J. G. Crowley.

It will be observed that while the wood construction has fallen off 20 per cent. during the quarter ended September 30, 1902, as compared with the same period a year ago, steel construction has increased more than 150 per cent. The figures for the entire fiscal year will probably show a corresponding decrease in wood construction, but it is not expected that so large a gain in the construction of steel vessels will be recorded. In the statement of steel steam vessels given above the companies building them are in several instances set down as owners. This is due to the fact that in some cases the title to the vessel is still in the shipbuilding company, not having passed to the parties for whom the vessels are being built. It should be understood that the official numbers are given to vessels before they are entirely completed, and it sometimes happens that a month or so may elapse after a vessel is numbered before it is turned over to the owners and put in commission.

The Bureau of Navigation is unofficially advised that the output of American shipyards during the present fiscal year will be based very largely on contracts made in the last fiscal year and that very few contracts of importance are likely to be made. It is estimated that on July 1, 1901, 255,000 tons of ocean steel steamers were under construction or contract. Of this about 100,000 tons were finished prior to July 1, 1902, and about 30,000 tons have since been completed, leaving only about 130,000 tons of this work still on hand. W. L. C.

John D. Williams, assistant to the general manager and superintendent of the mill of the United States Tube Company at Buffalo, N. Y., was killed September 24 by a Delaware, Lackawanna & Western train. He was born in Danville, Pa., 63 years ago, which place he had always made his home, and has been in the steel manufacturing business for over 50 years, having first entered a mill at the age of ten years. During his business career Mr. Williams has held many responsible positions in steel plants in various parts of the country, and previous to entering upon his duties with the United States Steel Company, about nine months ago, he was superintendent of the Kellogg Seamless Tube Company, Findlay, Ohio. He has also served in the same capacity at the Cock Robin, Rough and Ready, Co-operative and North Branch Steel Company's mills, all at Danville, and has worked in large steel plants at Pittsburgh and Chicago. A widow, four daughters and a son survive him.

The National-Acme Mfg. Company, Cleveland, Ohio, manufacturers of the Acme multiple spindle automatic screw machine, also of set screws, cap screws, machine screws, &c., announce the opening of a Western office at 2 and 4 South Canal street, Chicago, under the management of George D. Grant.

The announcement is made that the Field & Croxton Iron Company of Cincinnati have been selected to represent the La Follette Furnace in that field and they are now offering the product of that furnace.

A receiver has been appointed for the Grant Tool Works Company of Franklin, Pa. The petition for the appointment of a receiver was filed by Mrs. John McKeown of Washington, Pa., who alleges that the company owe her $160,000. Other liabilities are placed at $70,000, but it is said the company have assets of $550,000. The Franklin Trust Company of Franklin were appointed receivers and will continue to operate the plant. There will be no change in the management for the present.

PERSONAL.

John O. Pew, general manager of the Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, has gone to Mt. Clemens, Mich., for a few weeks' vacation for the benefit of his health.

A number of leading officials of the Jones & Laughlin Steel Company of Pittsburgh are visiting the company's ore properties in the Lake Superior region. Included in the party are Willis L. King, George B. Laughlin, William Larimer Jones, Thomas O'Connor Jones and B. F. Jones, Jr.

S. V. Huber of Pittsburgh, the well-known consulting engineer, will probably sail for Europe at an early date. Mr. Huber intends to visit the Düsseldorf Exposition.

J. G. Butler, Jr., and H. H. Stambaugh of Youngstown, Ohio, have returned from a month's trip to California. While there they visited Tod Ford, a former manufacturer of Youngstown, who has lived for some years in California.

W. J. Totten, manager of sales at St. Louis for the Carnegie Steel Company, Illinois Steel Company, American Steel Hoop Company and National Steel Company, announces that Wm. B. Weston has been appointed assistant manager of sales, succeeding John R. Scott, who resigns to become manager of sales at New Orleans. Mr. Weston was formerly representative of these companies in the republic of Mexico.

J. Campbell MacMillen of Glasgow, Scotland, has been a visitor in Chester, Pa., for several weeks on business and pleasure combined. Mr. MacMillen is representing the firm of Mathison & Co. of Glasgow, manufacturers of edge tools, of which firm he is a member and one of the directors.

William T. Coppins, treasurer of the Bestos Steam Packing & Supply Company, Boston, who are agents for Turner Bros., Rochdale, England, sails for Europe on the "Campania" from New York, October 11, to be abroad about six months.

F. H. Treat, formerly general superintendent of the American Iron & Steel Works of Jones & Laughlin Steel Company, at Pittsburgh, has opened an office in room 1206 Empire Building, Pittsburgh, as consulting engineer for the construction of blast furnaces, steel works and rolling mills.

Henry Phipps of the Carnegie interests was a visitor in Pittsburgh this week looking after his various interests in the Pittsburgh district. Mr. Phipps, with his family, expects to spend the coming winter in India.

Charles H. Booth of the Lloyd Booth department of the United Engineering & Foundry Company, at Youngstown, Ohio, has returned to Youngstown after a three months' trip to Europe. Mr. Booth reports considerable activity in the iron and steel trades on the other side, and attributes it in some measure to the large demand from this country for foreign billets and pig iron.

George Westinghouse of the Westinghouse interests, at Pittsburgh, is in that city this week looking after his business affairs. Mr. Westinghouse also attended the annual meeting of the stockholders of the Westinghouse Air Brake Company, held at Wilmerding on Tuesday.

F. C. Milliken, formerly district sales agent of the American Sheet Steel Company, has resigned, and has been succeeded by James A. Smith, who was formerly in the purchasing department of the American Sheet Steel Company in the head offices in New York City.

C. H. Halcomb, formerly president of the Crucible Steel Company of America, was a visitor in Pittsburgh last week. Mr. Halcomb denies that he contemplates engaging in the steel business at Buffalo or any other point. He has no business plans for the future.

John Reis, general superintendent of the New Castle Works of the National Steel Company, has given $5000 to the Shenango Hospital in New Castle.

A movement is on foot again to build a railroad from the Wheeling district to the Connellsville coke region. Wheeling manufacturers pay 25 cents a ton more freight on coke than the Pittsburgh district pays, putting them, it is claimed, at quite a disadvantage in matter of cost. It is said that a railroad line can be built from the Connellsville region to Wheeling that will give a shorter haul than to Pittsburgh. Senator Stephen B. Elkins is said to be actively identified with the new project.

United States Steel Corporation Earnings.

The United States Steel Corporation have given out a statement of earnings for the first nine months of the current year. The statement of earnings for the last three months, September being estimated, shows that the earnings were $36,764,643 for the quarter, which compares with $28,663,840 for the same period last year. The September earnings are estimated at $11,750,000, as against $9,272,812 for September, 1901. As the estimates heretofore have always been below the actual earnings September figures will probably reach $12,000,000. The statement shows:

	Net Earnings.	
January, 1902	$8,901,016	
February, 1902	7,678,583	
March, 1902	10,135,858	
April, 1902	12,320,766	
May, 1902	13,120,930	
June, 1902	12,220,362	
July, 1902	12,041,914	
August, 1902	12,972,729	
September, 1902 (estimated)	11,750,000	
Total net earnings after deducting each month the expenditures for ordinary repairs, renewals and maintenance of plants, also interest on bonds and fixed charges of the subsidiary companies		$101,142,158
Deduct amounts set aside for the following purposes, viz.:		
Sinking funds on bonds of subsidiary companies	$467,540	
Depreciation and reserve funds	10,306,565	
		10,774,105
Balance of profits for nine months applicable for United States Steel Corporation securities		$90,368,053
Deduct:		
Interest on United States Steel Corporation bonds for nine months	$11,400,000	
Sinking fund on United States Steel Corporation bonds for nine months	2,280,000	
		13,680,000
Balance		$76,688,053
Dividends for nine months on stocks of United States Steel Corporation, viz.:		
Preferred 5¼ per cent	$26,790,258	
Common, 3 per cent	15,249,665	
Dividends on outstanding stocks of subsidiary companies	148	
		42,040,071
Undivided profits for the nine months applicable to increase, "depreciation and reserve fund" accounts, for new construction or surplus		$34,647,982

The earnings for the first fiscal year were about $110,000,000. The net earnings so far show $101,142,158, with three months yet to come. Figured at $10,000,000 a month this would place net earnings at $130,000,000, or thereabouts. Of course a comparison is hardly fair, because in the last fiscal year the first three months of the present year were included, due to the shifting of the beginning of the fiscal year from April 1 back to January 1.

At the meeting of the directors on Tuesday the regular dividends were declared on the common and preferred stocks.

Joseph E. Porter, known throughout the world as an inventor and manufacturer of hay tool machinery, died at his home at Ottawa, Ill., September 21, after an illness of several months. The J. E. Porter Company, of which Mr. Porter was president, were established by him in 1868 for the manufacture of hay tools, and until 1893, when the growing trade made necessary the organization of a company, he was sole owner of the business. He organized and was the first president of the Inland Steel Company, now having plants at Chicago Heights, Ill., and Indiana Harbor, Ind., and was a director of that company at the time of his death. Mr. Porter was also vice-president of the National Association of Agricultural Implement and Vehicle Manufacturers, taking a very active and prominent part in the organization.

HARDWARE.

In connection with the marvelous progress which has been made in manufacturing methods, as the result of the enterprise and invention which have been so characteristic of American manufacturers, there has undoubtedly been a marked advance in their business methods. This is the case as a general rule in the various departments which have to do with the purchase of material, the operation of the plant and the marketing of the product. With the development of trade increasing attention has been given to the details of management and the introduction of good methods and systems which with the least labor will secure the best results. The large establishments as a rule have the best and most approved business methods, principally because in an extensive business the necessity for system is more imperative, and it is an easier matter to adopt and operate a system advantageously where there is a large product justifying the attention and expense. The ability, too, which is in direction of great houses, shows itself in the forming of plans and developing of routine in such a way as to make the business move along on right lines with as little interference of special direction as possible. For this reason the great corporations have, with scarcely an exception, established methods of internal administration and direction which in their spirit and many times in their details might with advantage be studied, if not adopted, by other manufacturers. There is not only the most unremitting attention given to processes of manufacture with a view to the improvement of the product and the constant lessening of cost, but there is the introduction in every department of exact business methods, so that everything moves along in appointed channels and under prescribed regulations in such a way as to produce the desired results at a minimum of cost and a maximum of promptness and efficiency. In all this an important part is the manner in which records are kept and results tabulated, so that those charged with the highest responsibility are not only kept informed in regard to the general state of the business as a whole, but are able readily to inform themselves in detail in regard to any desired particulars in any department. In many smaller establishments similar systems are used and most admirable business methods followed.

It is, however, generally conceded that this is a matter which is not receiving among manufacturers the attention its importance deserves. Many manufacturing enterprises have grown up under circumstances which caused more thought to be given to the manufacturing processes than to business routine. As a result, in not a few successful factories there is a crudeness and laxity of method, both in the office and in the works, which militates against a still larger success. The wise direction of a manufacturing enterprise in its operation at large and in all the details of routine and production requires exceptional ability and a combination of qualities not often found in one individual. With the changing conditions and the advance in both the mechanical and commercial field there is need for unceasing alertness and the constant adoption of changes to meet altering conditions. A fundamental requirement is that the manufacturer recognize the necessity of having business methods in the office and factory which will be in line with the best practice and secure the best results.

Condition of Trade.

With the advance of the season there is an emphasizing of the demand for holiday and winter goods, and these lines are moving freely. The gradual extension of the term Hardware so as to include among other things finer wares suitable for holiday sale is a noteworthy tendency, which also results from the development in business, according to which the stores are becoming more complete and attractive. In the principal Hardware lines there is little new to report. The reduction in Nails and Wire has had a temporary effect on the market, checking a little its confident and strong tone, especially as it is known that in a few other lines to which we have already alluded there is a probability that developments will be before long in the direction of lower prices. This is, however, as has frequently been pointed out, not to be taken as indicative of any general weakness. On the other hand, the tone of the Iron market continues exceptionally strong and the elements of cost generally are creeping up. Wages certainly have an upward trend, as gradual advances are being from time to time made. The fuel question is getting to be a serious one with many plants, and while it has not yet caused open advances the increased cost of fuel is entering into the goods, and if the present condition continues, even without getting seriously worse, it will show itself on the cost sheets of the manufacturers, and thus sooner or later be made known to the trade in the form of higher prices. The increase of manufacturing facilities goes on and the announcement of additions, the putting in of new machinery, the taking up of new lines and the establishment of new plants are commonplace occurrences. Trade throughout the country moves along at a good pace, and great quantities of goods are disappearing into the hands of consumers. Foreign trade feels unfavorably the influence of these conditions, and a diminished volume of exports in many lines is reported.

Chicago.

(By Telegraph.)

It is interesting to note that the effect of lower prices on Nails, Sheets, Wire and Wire products has been to increase the number and size of the orders received by manufacturers, but while jobbers themselves have thus bought more freely, dealers, especially those in the habit of sending orders by mail, have been indisposed to the placing of orders. This is only natural, however, being a confirmation of the usual experience that lower prices reduce, while higher prices stimulate the volume of business. As general conditions become more fully understood throughout the country, however, a material increase in business may be anticipated. Following in the wake of the lower prices above referred to there has been evidence that there may be also an adjustment of prices on Merchant Pipe and Boiler Tubes. It is well known that keen competition has already reduced prices, and the readjustment will be merely an official recognition of conditions which have prevailed for some weeks. It is also reported that lower prices have been made on Bolts, the slow sale of which resulted from the wet weather experienced during the summer. While the volume of general business during the month of September was fairly satisfactory, there are indications that anticipations of jobbers have not been fully realized, and the first few days in October have witnessed a decided falling off in shipments of standard goods and especially of Heavy Hardware. This is not the experience of all, however, and the movement in specialties has been very active. The distribution of all kinds of Household Goods, Kitchen Utensils especially, has continued on a very liberal scale. The demand for Shells and Ammunition of all sorts

has been more than usually active, and the liberal trade in Cutlery has continued to be a feature of interest. Manufacturers of Steel Goods are booking orders for next year's delivery, and some liberal contracts have been placed in this section. The trade in holiday goods has continued active. Manufacturers of Gas and Oil Heaters are overwhelmed with business and are compelled to turn down many orders, which, under ordinary circumstances, would be greatly welcomed. The unusual demand for Steel Hatchets and Hammers experienced by manufacturers' agents is especially noticeable because unseasonable; it is reported that some dealers during the month of September sold more goods of this character than during any three months previous. There is still much complaint of goods delayed in transit, some dealers claiming that 30 days is only an average allowance of time for goods from Pittsburgh to Chicago. In distributing goods from stock, however, there is little delay in shipment.

St. Louis.

(By Telegraph.)

The first week of the month has been marked by very busy conditions in the Hardware market and fully up to the standard of September. Orders for quick shipment have accumulated so rapidly that jobbers are compelled to practically work night and day in order to satisfy their customers. While the extremely unsettled price conditions existing in the market for Wire products has been a disturbing factor it has fortunately come at the time when trade in these products at this point has been very largely attended to for the season. As noted in reports from other sections the coal strike has greatly stimulated the buying movement in all soft coal and wood burning Stoves. The demand for goods for holiday trade is looming up in better proportions from day to day, and undoubtedly an extremely large trade will be done this fall in this class of goods. Collections are said to be generally favorable.

NOTES ON PRICES.

Wire Nails.—The action of the American Steel & Wire Company in making a reduction in prices of Wire Nails, Barb and Plain Wire and Staples, which took effect October 1, was unexpected by most of the trade at this time. It was considered, however, that if existing conditions continued some radical action would be necessary. The reduction has had the effect of checking buying to some extent, and while there is a fair volume of business there is apparently a temporary holding off from buying beyond present requirements. It is understood that some of the independent manufacturers are bidding for business, soliciting quotations before placing orders. The regular quotations are as follows: Carload lots, $1.90; less than carloads, $1.95, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days. For galvanizing Nails 75 cents per keg extra is charged and for tinning Nails the extra per keg is $1.50.

New York.—The reduction in the price of Wire Nails has resulted in a dropping off on orders in the local market. Quotations are as follows: Single carloads, $2.05; small lots from store, $2.10 to $2.15.

Chicago, by Telegraph.—The independent manufacturers of Wire Nails, who met in Chicago October 2, sanctioned the prices made on the previous day by the largest interests in the market, and sales have recently been made on the basis of $1.95 to $2, in carload lots, and $2.05 in less than carload lots, Chicago.

St. Louis, by Telegraph.—A fair demand is reported among the jobbers for Wire Nails and the price asked is more favorable to the buyer. Small lots from store are quoted at $2.15.

Pittsburgh.—The reduction in prices of Wire Nails announced by the American Steel & Wire Company, and referred to in this report last week, was not altogether unexpected by the trade. The facts are that prices of Wire Nails had been more or less elastic for some time, and in order to give more stability to the market the reduction in prices was decided upon. It is hoped that it will have the effect of steadying the market and bringing about a better demand for Wire Nails than has existed for some time. We may state that the leading independent manufacturers of Wire Nails and Wire have adopted the same schedule of prices as was put in force on October 1 by the American Steel & Wire Company. We quote Wire Nails at $1.85 to $1.90 in carloads and $1.90 to $1.95 in less than carloads, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Cut Nails.—The scarcity of Cut Nails continues, with a disposition of the part of some manufacturers to make as few as possible, in view of the high price of raw material. The market continues firm at former quotations, which are as follows: $2.05, base, in carloads, and $2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

New York.—The demand for Cut Nails at this point is moderate, with unchanged prices. Quotations for carloads and less than carloads are as follows:

Carloads on dock	$2.18
Less than carloads on dock	2.23
Small lots from store	2.30

Chicago, by Telegraph.—While there has been no official action somewhat lower prices have prevailed for Cut Nails, sales of carload lots being reported at $2.10 and less than carload lots at $2.20 to $2.25, base, Chicago. There has been less activity during the week.

St. Louis, by Telegraph.—The demand for Cut Nails is light and the quotation for small lots from jobbers' stock is $2.35.

Pittsburgh.—As yet the manufacturers of Cut Nails have not made any reduction in prices to correspond with the cut made in Wire Nails, nor will any change be made until the next meeting of the Cut Nail Manufacturers' Association, which will be held on Thursday, October 16. It is not known now whether any change will be made at that meeting. The fact is pointed out that prices of Steel continue high and there is very little profit in present prices of Cut Nails when the high prices of Steel is considered. We note a moderate demand for Cut Nails and the tone of the market is fairly strong. Iron Cut Nails continue to bring about 10 cents advance over Steel. We quote Steel Cut Nails as follows: $2.05, base, in carloads, and $2.10 in less than carloads, plus freight in Tube Rate Book to point of destination, terms 60 days, less 2 per cent. off in 10 days.

Barb Wire.—The reduction in the price of Barb Wire has resulted in an increase in orders placed by jobbers with the mills. Quotations are as follows: Painted, in carloads, $2.20; Galvanized, $2.50; less than carloads, Painted, $2.30; Galvanized, $2.60, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days.

Chicago, by Telegraph.—Manufacturers have booked some liberal orders during the week, but the jobbing trade has been only moderate. The following are the prices current in harmony with the revision recently made by the largest interests in the market: $2.60 for Galvanized in carload lots and $2.70 in less than carload lots; Painted at $2.30 in carload lots and $2.40 in less than carload lots, with 5 cents extra for small quantities from store.

St. Louis, by Telegraph.—Owing somewhat to the unsettled condition of the Wire market Barb Wire is in light demand. Painted is quoted at $2.50 and Galvanized at $2.80 in small lots from jobbers' stocks.

Pittsburgh.—The reduction in prices of Barb Wire made last week by the American Steel & Wire Company was not altogether unexpected, but the trade were hardly prepared for so heavy a cut, which amounted to $7 a ton. It is hoped that the lower price will stimulate demand and give a stability to the market which it has not had for some time. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount off for cash in 10 days: Painted, $2.15; Galvanized, $2.45, in carloads; less than carload lots, Painted, $2.20; Galvanized, $2.50.

Plain Wire.—The demand at mill has shown some increase since the reduction. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. for cash in 10 days: Carloads, $1.80; less than carloads, $1.90. The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	Plain.	Galv.
6 to 9	Base.	$0.30
10	Advance over base	$0.05 .30
11	" " "	.10 .30
12 and 12½	" " "	.15 .30
13	" " "	.25 .30
14	" " "	.35 .30
15	" " "	.45 .60
16	" " "	.55 .60
17	" " "	.70 1.00
18	" " "	.85 1.00

Chicago, by Telegraph.—There has been an increased movement from the mills, but the jobbing trade has been light. In carload lots on track sales are made at $1.90; in less than carload lots at 2 cents extra from store. Galvanized, both on track and from store, 30 cents extra.

St. Louis, by Telegraph.—The price feature is the only new one in the market for Plain Wire, the volume of demand being along the same lines as last reported. No. 9 is quoted at $2.10 and Galvanized at $2.40 in small lots from jobbers' stocks.

Pittsburgh.—The trade were somewhat surprised at the heavy cut in prices announced last week by the American Steel & Wire Company. It is believed, however, that demand will steadily show improvement and the market will be more uniform than for some time. All the principal Wire mills have adopted the same schedule of prices as American Steel & Wire Company. We quote Plain Wire at $1.75 to $1.80, base, for Nos. 6 to 9; Galvanized, 30 cents extra, for Nos. 6 to 14, and 60 cents extra for Galvanized, Nos. 15 and 16.

Cast Iron Hollow Ware.—At a recent meeting of the manufacturers of Cast Iron Hollow Ware revised prices were adopted embodying an advance of from 5 to 10 per cent. Existing quotations are in a general way represented by the following, 60 days, or 2 per cent. discount for cash in 10 days:

	Discount.
Plain or Unground Ware	65 and 5 %
Ground Ware	60 %
Enameled Ware	55 %

Cordage.—Owing to competition and the approach of the dull season in the Rope business the market shows less strength. A large proportion of so-called Sisal Rope contains other fibers. Some classes of Jute Rope are quoted at about ½ cent advance. Quotations range, on the basis of 7-16 inch and larger, from 9¼ to 9½ cents for Sisal and from 12¼ to 12½ cents for Manila Rope.

Glass.—The reorganization and chartering of the Independent Glass Company, which is expected to eliminate the disturbing element, is about the only movement during the week toward clearing up the situation. It is supposed that the 28 factories formerly in the Independent Glass Company, with the exception of one, will either be in the newly organized company or in the Federation Company. The fact that the smaller sizes of foreign Glass can be imported at a less price than the combined factories made to the Jobbers' Association seems to have been entirely left out of the manufacturers' calculations. The situation is not yet regarded by the jobbers as satisfactory. Manufacturers of Plate Glass have made an advance of 10 per cent. on all Plate Glass under 10 feet square, except that used for silvering. The Jobbers' Association quotations are as follows for single and double strength Window Glass:

	Discount.
From store	88 and 5 %
F.o.b. factory, carload lots	89 and 5 %

Oils.—*Linseed Oil.*—On September 30 manufacturers of City Raw reduced the price to 52 cents per gallon, in lots of five barrels or more, and October 4 another reduction brought the price down to 50 cents in the foregoing quantity. Out of town Raw is quoted at 47 cents in lots of five barrels or over. The causes of the lower prices are competition and the coming down from a high market to a low one, incident to the declining cost of Flax Seed. Crushers buy Seed and crush it, and are anxious to get the Oil off their hands before another decline takes place in Seed. Business is active, but orders are mostly confined to small lots.

Spirits Turpentine.—There have been further advances in Turpentine during the week, owing to small local stocks, light receipts and a strong Southern market owing to export buying. Only small lots are changing hands at this point. Quotations, according to quantity, are as follows: Southerns, 53 to 53½ cents; machine made barrels, 53½ to 54 cents per gallon.

A HARDWARE FLOAT.

At the two hundred and fiftieth anniversary of the town of Norwalk, Conn., there was a large parade, in which most of the leading business houses of the city participated. The accompanying illustrations show the two sides of the float of the Hardware firm, Hubbell & Keeler. A platform 8 feet wide and 15 feet long

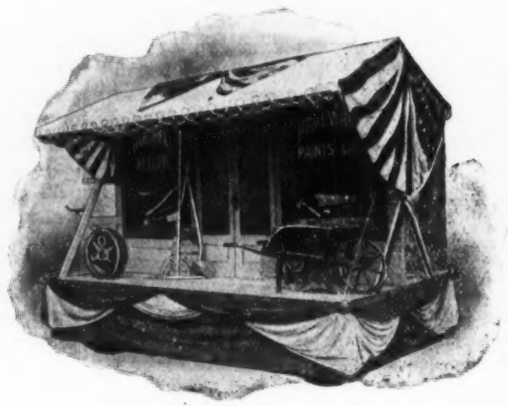


Fig. 1.—Reproduction of Store Front.

was placed on the wagon. On this platform stood a wood partition 8 feet high. One side of the partition, as shown in Fig. 1, was painted to represent the front of Hubbell & Keeler's store. This was decorated with Hardware, a Wheelbarrow, a Wood Pulley, Belting, &c. The awning was draped with White Cotton Rope. The other side of the float, shown in Fig. 2, was made to represent the front porch of a house, to advertise the Door, Sash and Blind business which is carried on by the same firm. The roof was covered with red

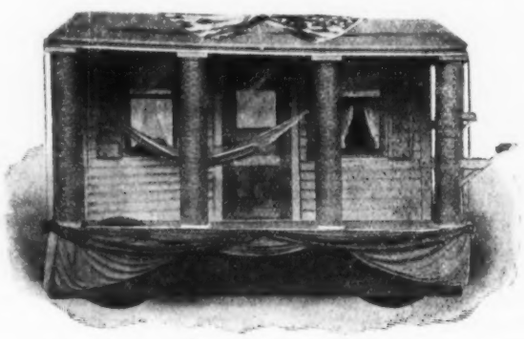


Fig. 2.—Showing Front Porch of House.

roofing paper and the columns consisted of 6-foot rolls of Poultry Wire. The door was a regular stock door with bevel plate glass and the background of the windows, which was made of black tar paper, was draped with lace curtains. Over the platform of the float was hung blue and yellow cheese cloth, the Colonial colors, which were prominent in the city decorations at the time. This float brought much favorable comment and it is claimed proved a very profitable advertisement.

PAINTS IN THE HARDWARE STORE.

WE give below extracts from further letters which have come to us from jobbing houses and manufacturers in regard to the evident tendency on the part of the Hardware trade to handle Paints. It will be noticed that they confirm the statements made by our correspondents whose letters were given in our last issue that Paints are a line of goods which can and should be sold in connection with Hardware:

Paint Invariably One of the Lines Put in by New Dealers

From a Minnesota Jobbing House: We find that through the older portion of the territory which we cover—namely, the northern peninsula of Michigan and parts of Wisconsin—Paint is carried quite extensively by the drug trade, although the Hardwaremen are working gradually into it. Particularly is this the case where new Hardware stores are being established, in which case Paint is invariably one of the lines put in with an opening stock; but in the new territory, such as the northern portion of Minnesota and North Dakota, the Paint business is being done almost altogether by the Hardware trade. It would seem like a case of evolution; originally in the drug trade's hands, after a while being controlled by the Hardware trade, and yet after the towns get to be of considerable size Paint is a specialty, carried largely by itself. Our opinion is decidedly that Paint is a most harmonious line in connection with Hardware and is carried both advantageously and profitably by the Hardware trade on whom we call. The tendency, as previously advised, is more and more for the Hardware stores to carry Paint.

Florida Merchants All Carry Paints.

From a Jobbing Concern in that State: The handling of Paints is quite an important feature in our business, as we sell at least $30,000 worth of Paints and allied goods per annum. All the Hardware dealers, both retail and wholesale, in our State carry Paints in connection with Hardware.

Can Be Successfully Handled by the Trade in Country Towns.

From Pennsylvania Jobbers: We find a great many retail Hardware stores handling Paints. We have sold more or less Paint to the retail trade, and we think it is a line that could be handled by the retail Hardware stores in country towns.

Unquestionably a Kindred Line.

From a New York House: Paint is an item that has not been carried by our house. In our present quarters there is very little room to expand and take in such an important line as Paints. It is unquestionably a kindred class of goods that would fit into a Hardware stock, and no doubt develop into an extensive department with most houses. We understand that the profit on ready mixed Paints is quite as satisfactory as on the general line of merchandise that Hardware dealers carry, but Oils and Varnishes in bulk and sold by measure we understand do not afford a satisfactory profit, and like a few items in all clasess of business, are the "bugbear" that is dreaded by the dealers.

Paints Handled Almost Exclusively in this Section by Hardware Merchants.

From a Jobbing House in Ohio: In this section of the country and over the territory we travel Paint is handled almost exclusively by the Hardware trade; we know in some sections it is handled by the druggists. It is our opinion that the Paint business belongs to the Hardware trade and not the drug trade. We do not know that we can offer any particular suggestions, but we certainly do think Paints belong to the Hardware dealer. When you take into consideration that a party building a house or a barn or making any improvements goes to the Hardware dealer for his Nails, Locks, Hinges, Screws, &c., it is very convenient if he can complete the work and buy everything from the Hardwareman, which would include, to finish the house, in the majority of cases, Paint.

Will Devote More Attention in the Future to Paints

From a Missouri Concern: In a rough way, I estimate that 25 per cent. of our retail Hardware customers carry Paints in stock. In our opinion, Paint is a line that can be advantageously handled in connection with Hardware. We ourselves carry a very complete stock of Paints, and propose in future to devote more attention to this line.

Rapidly Passing Into the Hands of the Retail Hardwareman.

Comments by a Kansas Concern: We think we can see the Paint business rapidly going into the hands of the retail Hardware dealer. We ourselves put in a stock this spring, and many of our Hardware customers who never handled it before are buying opening stocks from us.

Bulk of the Paint Trade Going to the Hardwareman.

From Farwell, Ozmun, Kirk & Co., St. Paul, Minn.: On the sale of Paints and Oils our observation and experience go to show that the Hardware dealers are in better position than any other class of trade to handle them. The customer comes to the Hardwareman for his supplies in building and repairing, and thus the latter has the first and best opportunity to secure his Paint order. He not only can have generally the first opportunity to sell the Paints, but this chance has come to his door without trouble or expense and he has the further advantage that his customer prefers to buy as much as possible of what he needs from one merchant.

The Hardware dealer is certainly most favorably situated for securing the trade and there is no reason why the druggist or some other merchant should get the long end of it.

Our house has been so well convinced that this is true that we decided two years ago to equip a plant and make our own Paints, and by holding rigidly to our ideals as to high and uniform quality we hoped to build up a more permanent and satisfactory trade than we could expect otherwise to reach. We are confident of the correctness of this view.

It is our belief that the Hardware trade will soon sell much the larger part of the Paints and Oils required throughout the country and that the retail Hardware dealer should now accept this as the legitimate evolution of the Paint trade and get ready to secure his share of it. So far as we know there is not an argument of weight against it and we are sure that the tide that has set in so strongly in this direction will not recede or be diverted to other channels; in short, we think the bulk of the Paint trade is going to the Hardwareman.

An Evolution in the Distribution of Paints.

From a Pennsylvania Manufacturer: We have read with interest the article on "Paints in the Hardware Store" in your issue of the 2d inst. In former years we disposed of a large part of our product through the jobbing drug trade, but latterly we observed a great change: the drug trade handle comparatively little, and our product is mainly distributed either through those houses who deal exclusively in Paints or through large Hardware jobbers and smaller dealers. In Pennsylvania the large buyers who are not themselves manufacturers of Paints are almost without exception connected with the wholesale Hardware trade.

More Natural in Connection with Hardware.

From a Prominent Manufacturer: We have always understood it was the practice in many States for the Hardware trade to carry Paint as a side line, and while it is true that in some places the custom of the town makes the druggist the distributer of Paint it would seem more natural to go along with the trade which comes in contact with the builders.

The General Practice.

From a Pennsylvania Manufacturing Concern: We think it eminently proper that the Hardware trade

should handle a full line of Paints, Varnishes, &c., and we believe that this is the general practice in this and adjoining States.

From a Manufacturer of Oil.

We have quite a number of Hardware jobbers selling our product; and, of course, our trade with this class of customers has increased considerably during the past four years; but, as our trade with all classes of customers has increased at the same time, it would not necessarily argue that there is an increased tendency on the part of Hardware firms to handle Oil of this character. On the whole, we find that Hardware people generally handle Painters' Supplies, and naturally they would endeavor to carry in stock materials that were in demand or called for. This, of course, would depend somewhat on the extent to which products of this character were advertised or trade solicited. We think the Hardware trade are keeping pace with other lines of trade in their dealings with us.

THE PATTON PAINT COMPANY.

The Patton Paint Company, Milwaukee, Wis., manufacturers of Patton's Sun Proof Paints, have issued Catalogue A, giving a list of all of their products. It is a cloth bound book of 254 pages covering a large line of Paints for various purposes; also Brushes, Painters' and Paper Hangers' Supplies, Plate and Window Glass, &c. A number of supplementary pages in colors are devoted to Stained Glass and Leaded Art Glass work. The Pittsburgh Plate Glass Company, 492-494 Market street, Milwaukee and other cities, are sole distributers of the Sun Proof Paints.

W. W. LAWRENCE & CO.

W. W. Lawrence & Co., Pittsburgh and New York, are distributing four pamphlets devoted to goods of their manufacture. One relates to Varnishes, Fillers, Bronzes, Shellacs, Dry Colors and Sundries; another to Oil Colors, Paste Paints, White Lead Paints, Zincs, Distemper and Japan Colors; the third to Paints, Stains and Enamels, and the fourth gives points on Putty of value to Hardware merchants.

PITKIN'S BARN PAINT.

Among the kinds of Paint which can be handled with advantage and profit by the Hardware trade at this season, the Geo. W. Pitkin Company of Chicago, Ill., mention their Barn Paint. This has been on the market for more than a third of a century, and is guaranteed by the company to wear at least five years. The Paint is referred to by them as a satisfactory article, having exceptional penetrating and preserving qualities, and it is stated the company advertise the Paint in a manner calculated to create a demand. In addition to furnishing the dealer with a liberal supply of color cards, attractive inside and outside hangers and signs for store advertising, a series of attractive advertising cuts, with room for the dealer's name, are furnished for use in the local papers.

RUBEROID ROOFING.

The Standard Paint Company, New York and Chicago, manufacturers of Ruberoid Roofing and P. & B. products, recently received an order from the managers of the Texas State Fair, Dalias, Texas, for 108,000 square feet of their roofing to cover the exposition buildings which were destroyed by fire June 20, 1902. Many of these buildings were covered with this Roofing previous to the fire, and the officials credit the Roofing with having prevented the total destruction of all the buildings on the fair grounds. None of the buildings covered with the Roofing was burned. In one instance, it is said, burning shingles fell and lay on the roof of one of the buildings covered with the Roofing until they literally cooked it, but its nonconducting properties prevented the fire destroying the sheathing underneath and thus saved the building. In a letter to the company the general manager of the fair stated these facts.

Goodsell-Wilson Hardware Company, Spokane, Wash., have materially enlarged their establishment by annexing the premises in the rear, thus giving them a frontage on two streets.

EMPTYING OIL BARRELS.

IN many stores where Paints and Oils are kept the task of emptying oil barrels is a mean and dirty one. The F. Hallock Company, Derby, Conn., use a rather simple device which makes the emptying of the barrels comparatively easy, and which has the additional advantage of draining the barrel almost to the last drop. As shown in the accompanying illustration, a track has been constructed overhead which runs parallel with the line of oil tanks. This track is made of 2 x 4 timber, strengthened by a strip of iron being placed on each of its sides. On this track runs a trolley, which is made of four barn door hangers fastened to a wooden block at the bottom. From this block is suspended a differential pulley hoist, by which the barrel is raised, as shown. When it is desired to empty a barrel it is tapped and a faucet with a small nipple inserted. From this faucet runs a rubber hose, the end of which is put into

Emptying Oil Barrels.

the tank to which it is desired to have the Oil flow. It is claimed that by this method a saving of 75 cents in time and the quantity of Oil drawn is made on each barrel.

Letters From the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Cost of Doing Business.

Referring to the editorial comments in a recent issue in regard to the necessity of merchants taking into consideration the cost of transacting business we have the following communcation from a prominent New England house doing a wholesale and retail trade:

If the invoice cost of an article is $1 and it is sold for $1.25 it is easy to say we are making 25 per cent., but if the cost of doing business is 25 per cent. of the sales we are selling at a loss of about 6 per cent. instead of a profit of 25 per cent. It often happens that a line of goods must be sold at an advance of only 5 or 10 per cent. over invoice cost, but if $100 worth is sold at 5 or 10 per cent. advance another $100 worth must be sold at 40 to 45 per cent. over invoice cost to keep the sales on a paying basis. Jobbers sometimes make a failure by selling goods on a margin of 2½ to 10 per cent. when their expenses average 10 per cent. or more on the total sales.

After inventory is taken it is a good plan to look the

thing squarely in the face and ascertain the total cost of doing the year's business. If the result is unsatisfactory it may lead to greater care in the future.

A business which only pays expenses cannot be called profitable, especially as bad debts are not figured in the regular expenses and no allowance is made for goods which prove to be unsalable.

KEEPING TRACK OF ORDERS.

BY ALBERT STRITMATTER.

ONE of the aids to success under modern business conditions is the ability to receive goods when desired. This is advantageous because one does not then have to order so far in advance that the goods will be received long before they are needed and payment for them due so much sooner than payments are received from them. It is further desirable because one is then able to fill orders promptly. Many systems have been devised for keeping track of goods ordered. They are necessary because orders are often filled, especially in periods like the last few years, in several shipments. Such systems also enable one to keep after the people from whom goods are ordered and in this way frequently hasten the delivery of goods which go often to the customer, making most urgent appeal for their delivery.

Card Systems.

Among the various systems devised the writer has found a system based on cards to be the most satisfactory. Card systems are growing more and more in favor for several reasons. They can be expanded or contracted according to requirements. They are systematic, easily kept and referred to, comparatively inexpensive, and cards can be removed as soon as their usefulness is ended. The following system is one that has been in use, with slight changes to meet individual views in various business houses, and has given very good satisfaction. The cards may be of any size found most desirable and convenient. While this system requires some duplicate work in the beginning in making out the cards, the clerical work after a card is made out is very little.

Arrangement of Cards.

At the time of placing an order a card is made out as shown in Fig. 1. There are various ways of filing these cards. They may be placed in a case numerically, alphabetically by the names of the parties with whom

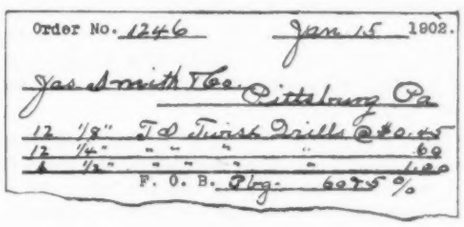


Fig. 1.—At the Time of Placing an Order.

the order is placed, or alphabetically by the materials ordered. The first method is probably the least satisfactory, as an index of some kind must be kept for it. In the third method it is necessary to use a separate card for each kind of goods ordered, or different orders should all be for one kind of material. In such cases

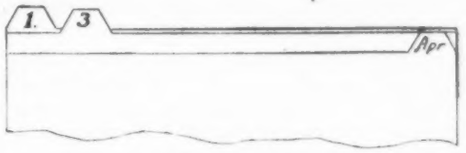


Fig. 2.—Index Cards.

separate orders would be made for each kind of goods ordered. In the system described, when an order is placed and the card made out it is filed in the case, and in front of it is placed a card which has a small tab or projection on it, as shown in Fig. 2. There are a large number of these cards, with the tabs located at different distances from the left hand edge. On the tabs are written or printed a number for each day in the month—*i.e.*: 1 to 31. As most cards are not wide enough to allow the use of 31 different tabs, it is more convenient to use cards with, say, but 15 different tabs. They are then numbered for every other day, as 1, 3, 5, and so on. This will be found as good a method as the other, and much more convenient.

Using the Cards.

When the order card is placed in the file one of these tab cards is placed in front of it, the date on the tab being several days ahead, by which time an acknowledgment should be received. When the order is acknowledged the tab card is removed and notice of the acknowledgment and date promised for shipment are entered, as in Fig. 3. The order card is then refiled

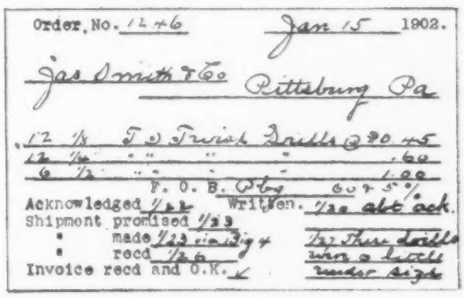


Fig. 3.—Acknowledgment of Order, &c.

and a tab card is placed before it, the date on the tab being that on which notice of shipment should be received. When such notice arrives the proper notation is made and a tab card is inserted bearing the date on which shipment should be received. When the goods are received the proper entry is made on the card. When the invoice is received and found correct a check mark is made and the order card is then taken from the file and placed in the permanent records for future reference.

Constant Attention.

Each day the clerk in charge of the system looks at the tab cards bearing that date. He refers to the order cards, and if no acknowledgment has been received writes a letter of inquiry, makes a notation of it and refiles the order card, using a tab card for a few days in advance. If several days have elapsed since the time for shipment and no notice of shipment has been re-

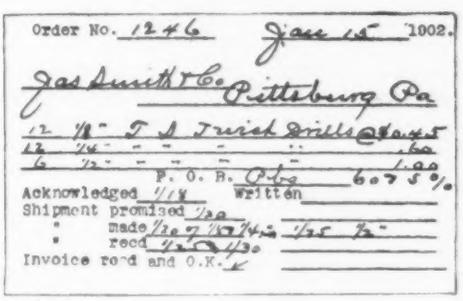


Fig. 4.—Different Dates of Shipments.

ceived a letter is sent. Sometimes it is desirable to use a tab card dated a few days ahead of the date for shipment, so that a letter can be written reminding the people that shipment was promised for such and such a date and urging that the promise be kept.

Valuable Information.

Space is left on the card for noting the date and subject matter of any letters written, also for other memoranda concerning the goods. It is not necessary that the prices, &c., be put on the card, but it makes a complete record with but little additional labor and enables the clerk to check the prices on the invoice when received. It is often desirable to make entries on

the card as to whether or not the goods received were good or bad. Many times when orders are being placed one wishes to know what kind of service has been given in the past and whether first-class goods have been received. The completed cards give data of this kind for past transactions and often prove valuable aids in determining where to place orders, prompt shipment of which is desired.

Deferred Shipments.

In cases where an order is divided into several shipments it may be desirable to make a new card for the balance of the order, making a notation on the first card that balance is on a second or third card. Where shipments are promised for a month or two ahead, as is often the case now, tab cards bearing the month may also be used and at the first of that month these are replaced by a tab card bearing the proper date in the month.

Adaptability.

The several sample cards given herewith show the various operations of the system. While it is not expected that this system will meet every condition, it will be found easily adaptable to almost every requirement.

SIMMONS HARDWARE COMPANY'S CATALOGUES.

SIMMONS HARDWARE COMPANY, St. Louis, Mo., have just issued illustrated catalogues Nos. 426 and 427, both of which are 9⅝ x 7¼ inches, containing 376 and 464 pages, respectively. No. 426 illustrates a complete line of Lamps, Chimneys, Wicks, Globes, Shades and other Lamp sundries in profusion. A large part of the book is given up to art pictures in fac-simile colors. No. 427 shows an exhaustive line of Sterling Silver, Silver Plated Ware, Cut Glass, Cutlery, Clocks, Watches, and numerous kinds of Art Goods, many of them reproduced in the original colors. An inspection of these catalogues emphasizes the diversity in stocks now handled by the Hardwareman.

THE H. C. TACK COMPANY'S CATALOGUE.

THE H. C. TACK COMPANY, Cleveland, Ohio, for whom J. C. McCarty & Co. are agents, 10 Warren street, New York, have issued an attractive illustrated catalogue and price-list of Tacks, Nails, &c., which they are manufacturing. Fac-simile illustrations in color are given of the fancy boxes and packages in which their Shoe Nails and Carpet Tacks are put up. In connection with their Buckeye and Standard Time Tacks a Nail Puller and a Watch, respectively, are given free with each gross box of these Tacks. A 10 x 12 Rhinehart colored photo also goes with each half gross case of their Indian Head Carpet Tacks. At the back of the catalogue is a list of the company's products, with space which may be used for noting discounts or net prices.

DISPLAY OF TOOLS.

IN the wholesale and retail establishment of the N. H. Benjamin Company of Phœnixville, Pa., of which J. P. Stetler is manager, a generous display of tools arranged in an elaborate manner greets customers upon entering the store. The display is located on the right hand side of the store near the front door, in a case 9¼ feet long, 9 feet high and 1 foot deep. The tools are shown in groups of one-quarter to one-half dozen of a kind, of different styles and sizes. Included in the display are Cross Cut, Butcher and Compass Saws, Wrenches, Hammers, Hatchets, Squares, Chisels, Auger Bits, Screw Drivers, Drawing Knives, Planes, Dividers, Plumbs and Levels, &c. The case is doubtless the means of disposing of many tools which probably would not be sold if they were not brought to the attention of customers by the display.

B. H. Sherman's Hardware store in Williamstown, Mass., sustained damage in a recent fire.

A POULTRY FOOD DISPLAY.

A RATHER unique and attractive display of Poultry Food has been made by Sugg & Lauderdale, Dyersburg, Tenn. A house of Poultry Food boxes was built in the show windows. This was made large enough to hold a hen and a brood of chickens. The floor of the window was next covered with sand. The hen was kept in the house and the chickens were given the liberty of the window. A sign reading "At Home" was placed over the door of the house. In the front of the window near the glass stood a basketful of nice clean eggs. The display caused much favorable comment and many people were attracted by this interesting window.

TRADE ITEMS.

EDWIN WALKER AND ZACHARY T. BRINDLEY have sold and conveyed the copartnership business, property and assets of the Erie Specialty Company, heretofore owned and carried on by them, to the Erie Specialty Company, a corporation organized under the laws of Pennsylvania, who will hereafter carry on the business. The company are manufacturers of a large line of Cork Pullers and Cork Screws, Lemon Squeezers, Shakers, Ice Shaves, Ice Picks, Potato Mashers, Rod and Wire Cutters, &c.

UNDERHILL BROS., manufacturers of Edge Tools, formerly located at 115 Broad street, Boston, have moved to 6 Sherman street, Charlestown, Mass.

L. A. KIMBALL, exporter of general lines of Hardware, machinery, &c., has moved his office from 107 Liberty street to 40 Murray street, New York. His trade is principally with Australasia, various South Seas markets, Germany, Russia and England.

THE MCILROY CORNICE WORKS, 1521 State street, Chicago, R. J. McIlroy and J. H. McIlroy, proprietors, have taken over the business of M. L. Jennings, formerly at 671 Larrabee street, and have formed a corporation with a capital stock of $6000, to be known as the McIlroy-Jennings Cornice Works. The new company manufacture Cornices and also make a specialty of Slate and Tile Roofing.

B. F. HADLEY, for many years with the Iowa Farming Tool Company, and Brown, Hinman & Huntington Company, has taken a position with the Continental Tool Company, Frankfort, N. Y., and will represent them in the South and West during the coming season. Mr. Hadley's long experience in the business and acquaintance with the trade will make him a valuable representative for the company with whom he is now connected.

MORLEY BROTHERS, Saginaw Mich., have bought out the stock, machinery and good will of the Flint Harness Company, Flint, Mich. They are removing the stock to Saginaw, Mich., and hereafter orders for the Flint Harness Company will be filled at Saginaw, Mich.

EIGHTEEN employees of the M. S. Benedict Mfg. Company, East Syracuse, N. Y., have recently organized what has been styled the M. S. Benedict Drum Corps. Before leaving on his vacation M. S. Benedict, president of the company, presented the members of the corps with uniforms, and to show their appreciation of his kindness the corps serenaded him on his return. The serenade was followed by a surprise to the men, Mr. Benedict taking them to the Yates Hotel, where an elaborate banquet was served.

BEGINNING with October 1 all domestic sales of the Champion division of the International Harvester Company will be made from the Chicago office. Heretofore the Eastern trade was handled from Springfield, Ohio. All plants of the International Harvester Company were shut down September 30 for inventory and repairs. Operations will be resumed in 15 days.

E. F. SMITH & Co., New Haven, Conn., manufacturers of Wire Netting, Dipping Baskets, &c., have removed to 29 Crown street, where they occupy four floors, having over 9000 square feet.

NOTES ON FOREIGN TRADE.

BRITISH LETTER.

Office of *The Iron Age*, Hastings House, Norfolk St., London, W C, Sept. 27, 1902.

The Week's Hardware Trade.

THE Hardware trade this week in a greatly increased number of branches has been more than usually active. Heavy deliveries have been made for autumn use, and a feeling of hopefulness has been manifested. Employment has improved, and there would seem some prospect of greater activity for the next month or so. In addition to the usual autumn orders, the splendid weather we have had during the past fortnight has no doubt stimulated trade, particularly where retail trade is affected. But while the orders are numerous they are not particularly large, and do not indicate any marked confidence on the part of buyers. A large proportion of these orders have come from London agents, but Scotland and the northern manufacturing towns have also shown good demand. In the agricultural district orders have come in for Galvanized Sheets, Buckets, Draining Tools, Fencing, Nuts, Bolts, Nails, Rivets, Wagon Axles and Agricultural Machinery. Altogether the past week may be recorded as unusually good.

A few weeks ago I commented upon the Pocket Cutlery trade of Sheffield. I can now add that this department shows marked improvement, so much so that the immediate difficulty is to find skilled workmen. When the Cycle boom was at its highest a great many men engaged in the Cutlery trade started in to make Cycles. Since the collapse of the Cycle trade a number of men have returned to their former employment, but there are fewer skilled workmen in the Cutlery trade to-day than was the case a few years ago. Nor are there so many apprentices, there being a distinct disinclination on the part of Sheffield parents to put their sons to this trade. One workman recently remarked apropos of this, "There's a lot to put up with, and very little at the end of it." The difficulty is the old one—keen competition, so that under the present system of production it is impossible to increase wages and so attract youths to the trade. Thus when good times come along Cutlery manufacturers are handicapped—a weakness which is obviously fatal. Export orders have come in recently for Cutlery, particularly from South Africa, but the old happy relations with the United States tend to grow less and less, and now the only American orders reaching Sheffield are for special goods. The drought in Australia has had a deterrent effect. Sheffield is now relying on small orders from an increased number of small markets rather than, as of old, large orders from a small number of markets.

On overseas account several large contracts for electric lighting apparatus have been received from Shanghai and Bloemfontein (as well as several north country municipalities). The increase in shipping freights to South America, which has just been notified, already has resulted in a depressing effect upon British trade with those markets. A number of American orders have reached this country during the past week, not only for coal and Iron, but also for Tin Plates, Saddlers' Ironmongery, Needles and Fish Hooks, Pottery and miscellaneous Tools and Hardware. Other lines of export are Iron Hurdles and Galvanized Sheets, but the export of Builders' Ironmongery shows a decline, while Naval Ironmongery shows an improvement. The japanners are busy, both on home and foreign account.

The Cutlery Trade and Foreign Organization.

As the export of American Cutlery will doubtless show an improvement soon after the boom in the home American trade has ceased, it may be well to draw attention to a project in which Sheffield manufacturers are concerned. The area of operation is in South Italy. This company, if successful, will doubtless find many imitators in other parts of the world, and in other trades which are affected by the same conditions. The proposal is based upon what many Sheffield manufacturers consider to be unfair competition on the part of other countries. From a paper dealing with this subject I extract the following points:

The preliminary notice points out that the pre-eminence of Sheffield is undoubted in the class of goods in which finish is of the first importance, and good quality is of greater significance than lowness of price. It is admitted, however, that there has been a great improvement in foreign manufactures of these goods, but that though they still sell at a lower price they make a larger profit than the British manufacturer at the expense of quality by the use of common raw material, by the suppression of various manufacturing processes which are essential to the production of perfectly finished articles, and by the employment of inefficient and poorly paid apprentices and workmen. Owing to the small margin of profit the Sheffield manufacturers cannot run too much risk and can only treat with well-known business houses. On the other hand, their opponents have canvassed the entire trade and all the merchants, they accept remittances in the currency of the country, deliver goods free of all charges to the buyer, accord long credits and give every kind of facility, accommodate themselves to the modes of business of their clients, and always correspond in the language of the country. Their travelers rent premises in important centers and show a complete exhibition of samples, which they take every pains to cause the trade to visit, and it is rare that a buyer visits such an exhibition without finding something for which he is willing to give an order. If it be asked why the large wholesale houses do not do for the British manufacturers what the German manufacturers do for themselves, the answer is that the supply of Tools is merely an accessory of their business, and if that does not answer they turn their attention to other branches of their business. Further, their great object being to effect sales and make money, the article sold is to them a matter of indifference, and perhaps they do not always inquire the true origin of an article which goes off satisfactorily. It is in the creation of markets that our competitors have distanced us, and our object should be not to compete with them in producing but in finding outlets for our goods. Here, of course, protection comes in, and becomes a great obstacle. The protected manufacturer sells his goods in his own country for more than their value, because the tariff keeps out goods which would otherwise compete with him. Hence he can afford to export at a much lower figure, because his export keeps his works going. To fight protection on these terms must be a difficult task, and the object of a company proposing to do it must be first to wage a pitiless war against goods suspected of being fraudulently sold as Sheffield made; and, secondly, to create depots all over the world with well assorted stocks and capable resident assistants, who would bring the manufacturers into direct communication with the markets or places where they reside. The company would be co-operative—that is to say, no manufacturer would have his goods sold by it unless he were a shareholder. It is calculated that about 10 per cent. on the wholesale price would cover all the expenses. The custom house dues being the same for all nations need not be taken into account, and there would only be the freight and the small expenses of the depots to be considered. An important point, however, arises as to the attitude of the wholesale houses. The promoters assert that no harm would be done to them, as it would be a principle of the company to sell good qualities only and to sell dear. It would appear that if the company wishes to compete with foreign goods their one object must be to sell cheaply; and, further, if this company succeed in Sheffield goods another company may be formed in any other line, so that the wholesale houses in any line of business might find themselves out in the cold and undertake reprisals. However little they might like it no wholesale house could justly object to an individual or a company placing depots or agents abroad, or even employing travelers, but this is a very different thing from a large "combine," which must effectually injure their business if it succeeds.

Trade-Marks in Egypt

For a long time past there has been much dissatisfaction with the interpretation of the Egyptian law in regard to trade-marks, and exporters interested in this trade have asked for new legislation. The *Egyptian Gazette* suggests that the decisions of the Mixed Tribunals are quite equal to waging war against fraudulent imitations. As Egypt is likely to be the gateway to the Soudan and Central Africa, it is important that the current of trade should not be vitiated at its source. I therefore, for the information of American exporters, give the statement made by the *Egyptian Gazette* almost *in extenso:*

The primary principle of protection afforded by the Mixed Tribunals to owners of trade-marks is that if a case of forgery or usurpation of a trade-mark be made out to the satisfaction of the Court an injunction is granted ordering the defendant to cease from importing or selling goods in Egypt bearing the mark complained of, under a prohibitive future penalty of so much per dozen or article sold or introduced in Egypt, and that such marks be erased at the expense of the forger or seller. Goods bearing forged trade-marks may now also be seized on a judge's order in the hands of the forger or seller. Registry of trade-marks can now be made at the Mixed Tribunals, and although not absolutely necessary is extremely desirable. Several actions have since occurred, and in all cases the decisions of the courts have been most fair and decisive. A laudably broad view has been taken of the word "imitation," and any obvious attempt to deceive, even though the wording or signs may differ, is held to be liable. It is important to observe, however, that in Egypt a person may plead ignorance, and this ought to impress upon manufacturers the necessity for registering designs at the Mixed Tribunals and for advertising the same in suitable ways. It is not necessary for a plaintiff to prove the bad faith of his opponent, but merely to establish his own good faith. A case has even occurred where a firm have been ordered to erase the word "Sheffield" from their goods because they were not manufactured there. This case was taken up by the Cutlers' Company of Sheffield. One of the most recent cases showed the value of having the trade-mark registered in Egypt. An English and a German firm had similar marks, the former registered in England and the latter registered in Germany. The English firm had also registered in Egypt. The decision given was that priority of registration, in the absence of very strong evidence to the contrary, will be held to establish for Egypt priority of user and exclusive property in the trade-mark registered.

The Transvaal Returns

During the first half year of 1902 the Transvaal imported nearly $22,000,000 worth of merchandise, compared with $5,700,000 during the corresponding period of last year. The trade in metals and manufactures thereof shows great improvement. There is an advance from $260,000 to $4,800,000. In this section are included Agricultural Implements, Iron and Steel Manufactures, Cutlery, Hardware and Machinery. Of these imports over $10,000,000 worth reached the Transvaal via Cape Colony, $9,000,000 through Natal and $1,700,000 worth by Delagoa Bay.

A Note on Curacao.

Judging by an official report just to hand from Curaçao, it would appear that the Canadian manufacturers have their eye on this market. They have adopted the British Consul in that quarter as a corresponding member, and he is laying himself out to help not only Canadian manufacturers but British manufacturers in general. As to the future of Curaçao there seems sound sense in the contention that when the Panama Canal bill has passed the House of Representatives and the President of the United States, and so brought east and west together, the island of Curaçao will take its place definitely as a trading center, deriving, as it must, great importance from its commanding position. If arrangements should be made for the building of a dock, Curaçao would undoubtedly become a commercial mart of great importance.

AUSTRALIAN LETTER.

FROM A SPECIAL CORRESPONDENT.

SEPTEMBER 8, 1902.

THE month of August has been a very quiet one for all classes of trade, although temporary stimulus was given to Melbourne retailers during the past few days by the presence of numerous "country cousins" who came down to the annual agricultural show. The drought is still with us, and the churches took a hand yesterday in a "day of humiliation and prayer." Our sheep and cattle have been waiting in countless thousands for several seasons for the grass which cannot grow, with the crows actually resting on their bodies and waiting for a chance to pick the eyes out of the living beasts, and if the Deity does not heed *their* supplications——

But this is a trade letter and not a theological discourse. Perhaps if some of your readers had stood alongside the writer a few days ago at an up-country station, and witnessed a long train of horses, cattle and sheep pass through on their way to the more fertile part of Gippsland, in this State, they might have queried the efficacy of prayer. The animals were mostly too weak to stand in the trucks, and those which could stand trod on the weaker ones. Added to this, many of the sheep were lambing (mostly dead lambs), and the mute suffering of the poor brutes would have touched a heart of stone. This was in Victoria, where the drought has in comparison with the other States been scarcely existent.

But what has this to do with a Hardware journal? Everything. The facts related above are merely to point out to American merchants that Australia is severely crippled in its staple industries. We must export in order to import, and as pointed out in a previous letter, the drought is paralyzing all classes of industry, and present indications are that we shall have to import wheat and flour before we are many months older, and, as every one knows, Australia runs California and Oregon a good second in wheat production in normal years.

The daily press here has striven a great deal of late to point out that the drought is not so severe as represented, and then in the very next issue has devoted column after column to anxious statements and forecasts. To be despondent is to be craven, to be optimistic would be folly. Australia will undoubtedly pull itself out of its present difficulties in due time, but the next few years must be lean ones. Our population is decreasing, and during the past few months no less than 2000 people, each possessing the minimum sum of £100, without which they are not permitted to leave, have departed from this one State of Victoria to South Africa. Two thousand adult workers out of a total population of 1,000,000. Our already too expensive governmental system presses heavily, and our politicians, being almost as numerous as our populace, effectually debar any reasonable scheme of retrenchment by reduction of members.

NEW ZEALAND advices point to the probability of a long continued spell of the present prosperity. Travelers' orders are very satisfactory in all classes of trade, and Hardware firms are getting their full share of the goood things.

TASMANIA orders are fairly full, and in Builders' Hardware there is good demand.

ELECTRICAL DEVELOPMENT is the most noteworthy feature in Australia at present, and is being energetically "pushed" throughout the land.

FOUNDRYMEN, though not full of business, seem to keep going in some degree, though where the work comes from is a mystery. There must, of course, always be a certain amount of repair work and small local requirements for the mining, shipping, and Implement firms, which will keep us from stagnating.

THE VICTORIAN HARDWARE ASSISTANTS' ASSOCIATION has closed another successful year, and will shortly remove to larger premises in the Citizens' Life Building, Collins street, Melbourne. A. W. Jones of T. J. Connelly & Son, South Melbourne, has been elected president for the ensuing year. Mr. Jones has been prominently associated with the concern since its inception, and has perhaps done more than any one else for the institution. Mr. Lowry (Morris & Meeks) is the new secretary.

JOHN MORRIS, senior partner in Morris & Meeks, wholesale Hardwaremen, died some few weeks ago, aged 74. The firm of Morris & Meeks are one of the oldest established of Melbourne Hardware houses.

H. A. URBAN, formerly connected with the Richmond Shovel & Tool Company, Richmond, Ind., in the capacity of general manager, is considering a proposition to take the management of a new plant that will shortly be established by Eastern capitalists for the manufacture of Forks and Hoes.

PRICE-LISTS, CIRCULARS, &c.

MALCOLM A. SHIPLEY, Philadelphia, Pa.: Fishing Tackle and Anglers' Requisites. The twenty-eighth edition of their illustrated price-list relates to Rods, Reels, Lines, Hooks, Baits, Flies, Nets, &c.

THE CRESCENT BELT FASTENER COMPANY, 143 East Twenty-third street, New York: Circular illustrating and describing the Crescent Belt Fasteners.

VERMONT FARM MACHINE COMPANY, Bellows Falls, Vt.: Illustrated catalogue No. 300 of Dairy and Creamery Apparatus and Supplies, including the improved United States Separators, Cooley Creamers and Agos Babcock Testers, also Sap Evaporators and Sugar Apparatus.

UNITED STATES WIRE MAT COMPANY, Decatur, Ill.: Calendar covering the period October, 1902, to December, 1903. The calendar is a beautiful one, reproducing in a very effective manner the famous Bryson painting, "At the Opera." The company intimate that they are prepared to send postpaid to any address on receipt of cost, 50 cents, a duplicate of the painting, without any printing whatever, for framing purposes.

BATAVIA CLAMP COMPANY, Batavia, N. Y.: Catalogue and price-list of Colt's Cabinet Makers' Eccentric and Screw Clamps, Colt's Malleable Iron and Steel Bar Wagon Jacks, &c.

J. E. RHOADS & SONS, 230 Market street, Philadelphia, Pa.: An attractively printed catalogue of more than 100 pages, representing their Beltings, Packings, Hose, &c.

RACINE BOAT MFG. COMPANY, Racine, Wis.: Illustrated catalogue of 80 pages, devoted to Steam Yachts, Launches, Cat Boats, Shells, Gigs, Barges, Canoes, Row Boats, Working Boats, Hunting Boats, &c. The company advise us that they have recently increased their output about 25 per cent., to take care of their growing export trade. At the present time they have agencies in England, France, Germany, Italy, Sweden, Denmark, Russia and Australia. They are also now making an extensive exhibit in the Crystal Palace, London.

THE WALLACE SUPPLY COMPANY, 56 Fifth avenue, Chicago: A pocket catalogue containing information and illustrations of Bending Tools, Gasoline Engine, Saws, Boring Machines, Drills, Forges, Ratchet Screw Drivers, Hollow Auger, Spoke Tenon Machine, Spoke Pointers, Vises, Clippers, Grinders and other machines for blacksmiths, machinists, founders, carriage and wagon makers, and other metal workers.

STANDARD AXE & TOOL WORKS, Ridgway, Pa.: Illustrated catalogue of hand made Axes. Particular attention is directed to their No. 999 brand of Axes.

GEO. CALLAHAN & CO., 218 Front street, New York: Catalogue relating to Cements, Oils and Greases, Mill, Factory and Foundry Supplies, Plumbers' Tinners', Roofers' Hardware, Stove and Furnace Sundries. At the back of the book is a list of the goods which apply to each branch of the trade. These are enumerated under the following headings: Mill, Foundry and Factory Supplies, Plumbers' Sundries, Hardware Sundries, Tinners' and Roofers' Sundries and Stove and Furnace Sundries. Each branch of business will find items of interest to them.

THE HARRIMAN HOE & TOOL COMPANY, Harriman, Pa.: Illustrated 1902-1903 catalogue and price-list devoted to Handled and Eye Hoes, Forks, Rakes, Drain Shovels, Handles, &c.

THE STORM MFG. COMPANY, Newark, N. J.: Catalogue relating to Dumb Waiters, Hand and Power Freight and Passenger Elevators.

J. T. SLOCOMB & CO., Providence, R. I.: Catalogue and price-list of Machinists' Tools, including Micrometers, End Measures, Micrometer Gauges, Combination Center Drills, Centering Tools, &c.

J. G. SPEIDEL, Reading, Pa.: Catalogues relating to the Columbia Safety Self Retaining Dumb Waiters, Elevators and Speidel's Improved Hand Power Hoisting Machinery.

J. M. MAST MFG. COMPANY, Lititz, Pa.: Circulars illustrating Nyssa Fishing Floats, Blizzard, Old Nick, Joker and Snap Shot Rat and Mouse Traps.

AMERICAN ELECTRICAL NOVELTY & MFG. COMPANY, 255 Center street, New York: 64-page illustrated catalogue of Ever Ready Electric Novelties operated by dry batteries, among which are Flash Lights, Canes, Bicycle, Carriage and Yacht Lamps, Scarf Pins, Surgical and Dental Lamps and Antiseptic Bulbs, Night and Watch Stand Lamps, Clocks and Candles in great variety, Ruby Lamps, Cigar and Gas Lighters, Advertising Signs and other goods of kindred character.

REQUESTS FOR CATALOGUES, &c

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

Brown Lumber & Hardware Company, Macksburg, Iowa, have just opened in the Hardware, Stove, Paint and Building Material business. They request copies of catalogues and price-lists relating to the above lines.

Queen City Range Company, East St. Louis, Ill., request catalogues, price-lists, &c., from all manufacturers of materials and supplies used in manufacturing Steel Ranges.

Carl W. Schmidt has recently bought the Barney Bros.' stock of Hardware, Stoves and Tinware at Sheffield, Iowa, of which he will take possession January 1 next. Mr. Schmidt advises us that he would be pleased to receive catalogues and quotations of Hardware, Paints, Sporting Goods, Agricultural Implements and Vehicles.

GEM FOOD CHOPPER ADVERTISING PAMPHLET.

SARGENT & CO., 149-153 Leonard street, New York, have just issued in the interest of the dealer a "Descriptive-Suggestive" pamphlet of 48 pages devoted entirely to their Gem Food Chopper. Divided in two parts, the descriptive portion describes in detail the Chopper, accompanied by appropriate illustrations. The second or suggestive section explains the advertising plans of the company and offers helpful suggestions to the Hardwareman. Methods of utilizing the store window are explained and advice given as to demonstrations, house to house canvassing and county fair exhibits. Under the head of local paper advertising are shown a large number of ready to print advertisements, electrotypes of which are furnished to dealers who sell the Gem Chopper. The advertisements are of many different sizes and shapes so that the merchant may avail himself of what best suits his conditions. In addition to the prearranged advertisements are a number of a pictorial character to which the dealer can add his own composition.

C. S. SMITH MFG. COMPANY.

C. S. SMITH MFG. Company, Milwaukee, Wis., recently completed a modern factory for the manufacture of Parlor Door and Barn Door Hangers. The plant is now in active operation and shipments are being made. Among the leading makes are the Lundy Parlor Door Hangers and the Peerless Loose Axle; the Perfection Roller Bearing Barn Door Hanger, cast or steel wheels. The "Never-jump" hinge wrought bracket Barn Door Track, in all sizes, and various styles of special Barn Door Track are also manufactured. The company have planned to make their line as complete as any other manufactured. The firm consist of C. S. Smith, Milwaukee, and A. W. Wagner, Chicago, the latter being the sales agent of the company for their entire output. The Milwaukee address is Thirty-second and Vleet streets, and the Chicago office is located at 40 Dearborn street.

The Granger Company, Badger, Iowa, have disposed of their business to P. A. Houge, who intends to make a large addition to the present quarters.

THE UNITED STATES COMPANY.

THE UNITED STATES COMPANY, 309 Broadway, New York, organized some months since, have just issued their first catalogue. The volume contains 118 pages, and in it they have not attempted to show a full line of Hardware, preferring to confine themselves to a few staples in specialties, which, they remark, they can handle in large quantities at a close margin. The list prices in the catalogue have been specially prepared by the company, and are subject to one simple uniform discount, so that a dealer can tell at a glance the net price of any article listed. The company aim to make these prices hold good until January 1, 1903, when catalogue No. 2 will be issued. Unless advised to the contrary they guarantee the prices given until that time. In regard to their methods they explain that their catalogue is their only salesman, that they sell only to properly rated dealers and for cash, that they are satisfied with a moderate profit, and are able to offer in many cases an extra 5 or 10 per cent. on shipments direct from the factory. The company advise us that their enterprise is progressing very satisfactorily and their list of customers and volume of business constantly extending.

MANNING, BOWMAN & CO.

MANNING, BOWMAN & CO., Meriden, Conn., have just issued a handsome catalogue, No. 34, containing 140 large pages, illustrating their product of Nickel and Silver Plate, Seamless Ivory Enameled, Perfection Granite Iron, Planished Copper Ware, Spoons, Forks, Knives, &c. The catalogue contains illustrations of their latest productions, together with an assortment of the most salable goods heretofore manufactured by them. They call attention to their line of Chafing Dishes as very complete, referring especially to the efficiency of their Ivory Enameled Food Pan. They are now placing on the market their new Peerless Alcohol Gas or Vapor Chafing Dish Lamp, which they allude to as possessing great heating power and being very easily regulated. Attention is also drawn to their Seamless Ivory Enameled Ware, having seamless bodies with improved mountings, and to their Meteor Circulating French Coffee Percolator, a recent production for which a good demand is reported. Besides the above goods the company make a complete line of Cork Extractors, Corking Machines, &c.

AMONG THE HARDWARE TRADE.

S. B. Bolen has removed his Hardware business from Gainesville, Texas, to Mangum, O. T. Mr. Bolen will add a line of groceries.

Blouch & Tawney have opened up in business in Princeton, Kan., carrying a line embracing Hardware, Stoves, Tinware and Agricultural Implements.

James Elms' Hardware store in Auburn, Maine, was damaged by fire a short time since. The loss was principally confined to goods in the basement of the establishment.

McClellan & Whitman, in the Hardware, Stove, Farm Implement and Wagon and Buggy business in Willow Springs, Mo., have dissolved partnership. W. A. McClellan is successor under his own name.

Turner Hardware Company are successors to Turner & Quinn, at Washington, Ga.

Burr Bender has purchased E. Bradley's interest in the Hardware business of E. Bradley & Co., Glendora, Cal., and the style of the house has been changed to Bender & Campbell.

Peter Myers' Hardware store in Wolsey, S. D., has been damaged by fire to the extent of $2000, the insurance amounting to $600.

R. J. Robinson has disposed of his interest in the Ashley & Robinson Hardware business at Milton, Vt., to A. B. Ashley, who will continue under his own name.

Milton T. Jones, successor to Smith & Jones, Utica, N. Y., wholesale and retail Shelf and Heavy Hardware, Agricultural Implements, Seeds, &c., is now located in the old Batchelor Block. The store has been finely fitted up and shows off the large stock to excellent advantage.

A. Rubel has purchased the stock and fixtures of the Lovell & Voodson Bros. Hardware Company, Lonoke, Ark.

Canby B. Morrison has sold his interest in the Missoula Hardware Company, Missoula, Mont., to C. S. Eycleshimer, who, with D. T. Curran, will continue the retail Shelf and Heavy Hardware, Stove and Tinware business, under the style of Curran & Eycleshimer.

The Girard Hardware Company, Girard, Ohio, have received their charter and have commenced business. The stores formerly conducted by Henry Hartzell and Henry Davis have been absorbed and merged in the new corporation. E. E. Zeller, formerly with Pittsburgh Gage & Supply Company, Pittsburgh, Pa., and later with Morris Hardware Company, Youngstown, Ohio, will manage the new company. The line of goods carried embraces Shelf and Heavy Hardware, Stoves, House Furnishing Goods, &c., there being also a department devoted to slating, roofing, tinning and furnaces.

The interests of Hiram Beshore and O. A. Martin in the business of the Marion Hardware Company, Marion, Ind., have been purchased by M. L. Lewis, J. G. Sayre and S. C. Willtrout, who will continue the business under the same style. Later they are intending to increase the capital to $50,000, and do both a wholesale and retail trade.

Ryan Implement & Hardware Company, Fort Dodge, Iowa, have purchased from A. M. Felts the building at present occupied by the company on First avenue south. The consideration was $21,000. Mr. Felts has bought stock in the company and expects about December 1 to take a position with them and interest himself actively in the business.

Thomas A. Lee has succeeded Lee & Pollock in the Hardware, Stove, Tinware, Agricultural Implement, Harness and Buggy business in Collinsville, I. T.

J. E. Dyche has succeeded Dyche & Fiegenbaum, Hardware, Stove, Tinware and Sporting Goods merchants, Lawton, O. T. Mr. Dyche intends to put more money into the business and to add the sale of Farming Implements and Vehicles.

C. E. Tyler, who started in the Hardware, Stove, House Furnishing and Roofing business at Rome, N. Y., last February, has put a new front on his establishment. The cost of this improvement has been $600, and the store is now referred to as one of the most attractive in the town.

Henry Katzenmyer has disposed of his Hardware business in Paulding, Ohio, to John P. Crain and John C. Coupland, who will continue under the style of Crain & Coupland. The members of the new firm are thoroughly known in Paulding and Paulding County. Mr. Crain formerly held a half interest in the Hardware business with Michael Finan and later was a member of the Paulding Lumber Company. Mr. Coupland was formerly county clerk, and subsequently in the lumber business in Missouri, the interest in which he will, however, retain for the present.

L. P. Gray and J. L. Everett, under the style of Gray-Everett Hardware Company, have within two or three months commenced the retailing of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, Buggies, Plumbing Goods, &c., at Fort Valley, Ga. Their store is 50 x 75 feet in dimensions, and has been attractively and conveniently fitted up

Geo. E. Baker has succeeded Baker & Turner in the Hardware and Agricultural Implement business in Ames, O. T.

Paris Robinson, Philo, Ill., has disposed of his Hardware, Stove and Furnace business to William Servis, who will continue at the old stand. Mr. Robinson will remain with Mr. Servis for two or three months, and will then probably locate in Champaign.

Todd & Hawley, Los Angeles, Cal., have been incorporated with a capital stock of $100,000, the incorporators being C. D. Todd, Geo. M. Marcus, C. Hawley, Geo. T. Hawley and W. N. Hawley. The company will handle Hardware and Agricultural Implements.

The Sparta Hardware Company have succeeded the Johnson-Davis Hardware Company at Sparta, Mo.

Walker & Reynolds opened a Hardware store at 5 South Broad street in the new Inman Building, Atlanta, Ga., in July last. Mr. Walker has been connected with the Hardware business of Atlanta for 18 years, Mr. Reynolds having been in the supply business for ten years. At present they intend doing only a retail trade, carrying a full line of Shelf Hardware, paying particular attention to builders' lines.

Meteer Bros. have succeeded Lewis & Meteer in the Hardware, Stove and Sporting Goods business in Richfield, Utah.

Little & McKee have succeeded J. K. Little in the Shelf Hardware, Stove and Agricultural Implement business in Cordell, O. T.

The Milligan Hardware & Supply Company have succeeded the Eagle Hardware Company, East Liverpool, Ohio, and will continue the wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Sporting Goods, Plumbers' and Gas Fitters' Supplies, Mill Supplies, Glass, Mantels, Tile Work, &c. They are also manufacturers of Brick Cutting Wires, Elevator Buckets and Electric Signs.

Carothers & Rogers are successors to Howard Carothers & Co. in the wholesale and retail Hardware, Stove, Tinware, Farm Implement and Sporting Goods business in Selma, Ala.

MISCELLANEOUS NOTE.

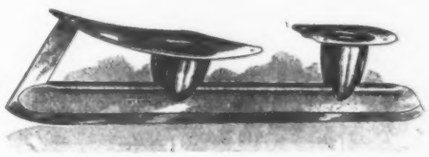
Jas. H Baker Mfg. Company.

Jas. H. Baker Mfg. Company, Pittsburgh, Pa., have issued several circulars relating to goods which practically are all new to them, including double tree and single tree hooks, grab hooks, eye bolts, slip hooks, hoist hooks, Baker brake rod end, Baker brake beams, &c. The company have just completed an extension to their plant. A new addition, as large as the old plant, is also going up. Practically all the machinery for the new building has been purchased, and some of it is now being delivered. The company advise us that they are adapting their plant to a heavier class of work than heretofore.

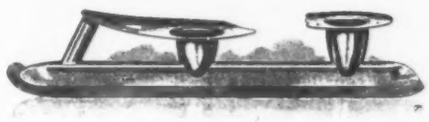
The Fisher Tube Skates.

The Crosby Company, Buffalo, N. Y., are offering the trade their tube skates, shown herewith, with new features added, for the coming season. These include a new design of foot and heel plates, which are perforated for riveting and screwing to the shoe. The front toe brace is of oval shape and secured so as to prevent all probability of coming apart. The blades of the racing model are made of thin tool steel, hardened and tempered, resting against shoulders inside the triangular tube, and are held in place by rivets and soldered. The tubes and cups are of sheet steel, the process of drawing them into shape being designed to make them unusually stiff. The cups are dovetailed and soldered to the tubes. The toe and heel plates are of half hard steel, and are seamed to the cups. The hockey skates have blades slightly thicker and of different front construction on account of the very hard usage to which they are subject. The regular model skates are referred to as comfortable because they are extremely light, and having a long blade ground absolutely flat—except at the extreme

Racing Model.



Hockey Model.



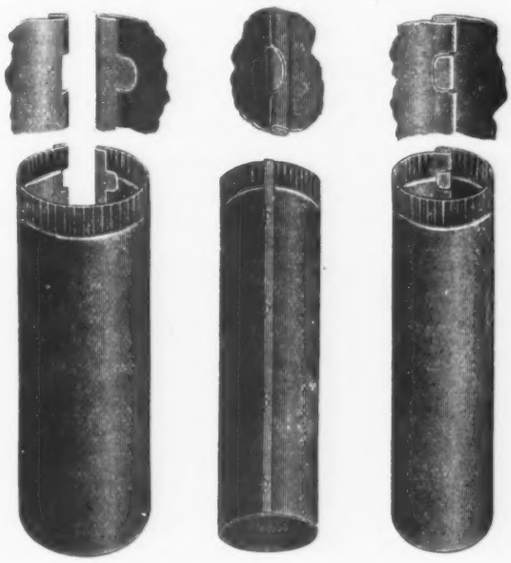
Regular Model.

The Fisher Tube Skates.

ends, which are rounded to prevent tripping—the weight is distributed equally over the entire surface. It is stated that the heaviest skater will not force these blades into the ice.

The Star Brand of Nested Stove Pipe.

The Wheeling Corrugating Company, Wheeling, W. Va., have just commenced the manufacture of nested stove pipe, as illustrated. The cuts show the pipe open and the outside and the inside of the seam after it is locked. The pipe is fastened at the point and butt

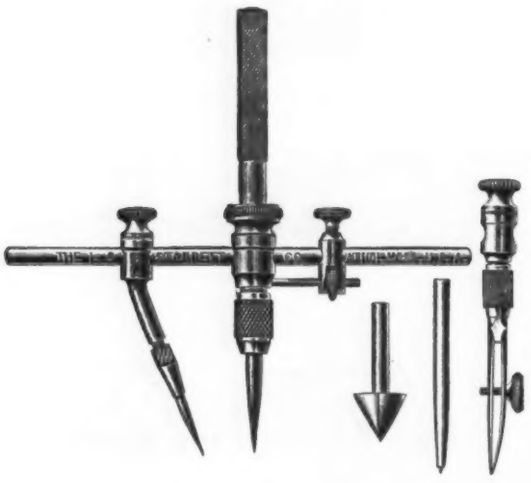


The Star Brand of Nested Stove Pipe.

with a small tongue, as shown in the smaller cuts above the pipe. The fastening being inside the pipe makes the seam smooth and even, looking like a plain double locked seam, of much better appearance, it is explained, than a riveted or other joint. The pipe is packed in crates of 25 and 50 joints each and in casks of 25 joints, and is made in two grades, smooth rolled and Wellsville polished.

Universal Dividers.

L. S. Starrett Company, Athol, Mass., and 123 Liberty street, New York, have added to their line the Universal dividers No. 89, here illustrated. The adjustable scriber holder is reversible and carries a fine tempered steel point or pencil lead, held in a split socket by a knurled nut. With the holder turned outward it is possible to work close to shoulders, a feature said to be peculiar to this make of divider; turned inward, the points may be

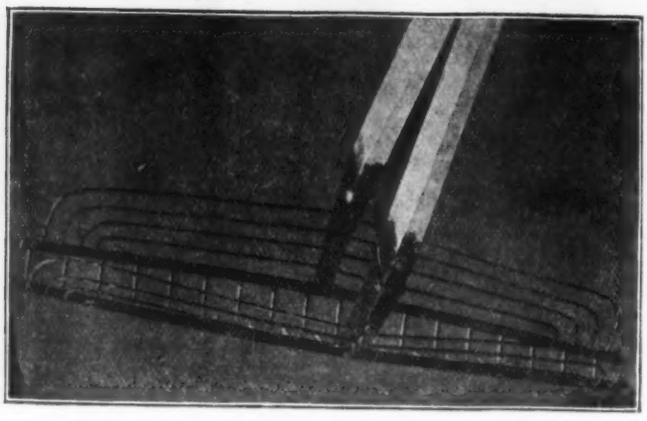


Universal Dividers No. 89.

brought close together to scribe the smallest circle. With a 4-inch beam or scribe holder a circle 7½ inches or less may be scribed. An auxiliary beam 13 inches long can be furnished with which a 25-inch circle may be drawn. The V center point can be substituted for the regular point when necessary for scribing around a drilled hole. Other points are the pen attachment for carrying ink and the needle point shown between the V point and pen attachment. The feature of the needle point consists of a delicate steel point inserted in the end of the round plain center, so that when used on paper, &c., it penetrates slightly, the offset keeping it from going further. As indicated by the cut, a fine adjustment of the center point can be readily made. Sometimes it is necessary to scribe a number of parallel circles at one operation, for which extra points can be supplied. The regular divider with 4-inch beam weighs 1½ ounces.

Shaw's Improved Steel Headed Oyster and Clam Tongs.

The accompanying cut represents improved steel headed oyster and clam tongs, manufactured by C.

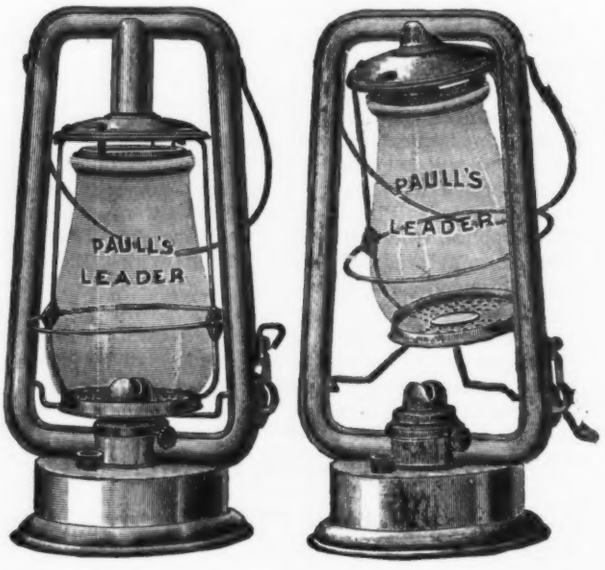


Shaw's Improved Steel Headed Oyster and Clam Tongs.

K. & W. T. Shaw, Bellport, N. Y. The heads and teeth of these tongs are made of the best tempered steel, so as to more than outwear two sets of the best iron headed tongs. The teeth are not welded into the heads, but are driven into holes drilled in the tong head, a fraction smaller than the teeth. This is to prevent their getting loose. When teeth are bent, broken or worn down by long usage they can be driven out with a punch and hammer and new ones inserted, thus practically making a new pair of tongs at small cost. The heads are alluded to as outwearing several sets of teeth. The tongs are made with full bosom to their heads, which are bowed downward so that the center teeth will strike first. The teeth are round, and flattened on the lower end so as to move easily in the bottom or bed. They can be set at different angles to dig deep or to take from the surface of the bottom as may be required. The tongs are securely fastened to the handles with iron straps welded to steel heads. The regular size in which the heads are made is 29 inches, with 18 teeth in each head, 1½ inches from center to center, but they can be furnished any length desired, with teeth of any length, set nearer together or further apart. Tongs are supplied with or without handles.

Paull's Leader Tubular Lantern No. 0.

The Wheeling Stamping Company, Wheeling, W. Va., have added to their line of lanterns the one shown in the accompanying illustrations. The lifting device does not simply raise globe for lighting, but also swings it out from between the tubes, thus leaving the way clear for



Paull's Leader Tubular Lantern No. 0.

filling the oil pot or for trimming the wick. The oil pot is extra large and the bottom is not soldered on, but is forced in by pressure to insure tightness.

Each lantern is tested under air pressure before shipping. The solder is applied to the lantern in only four places, the rest of the work all being done by machinery to secure uniformity and strength in every detail. Attention is directed to the one-piece stamped tube as a new feature in connection with lanterns. Each side of the tube is made of one piece of tin, being joined at the edge by a seam on which no solder is used.

The Amite Hardware Company, Limited, have succeeded J. Hamilton Warner at Amite City, La. The company have been capitalized at $10,000, the following being the officers: R. A. Kent, president; E. B. Dees, manager, and J. H. Warner, secretary and treasurer. The company will handle both Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Wagon and Buggy Material, &c.

Watchman's Electrical Lantern.

American Electrical Novelty & Mfg. Company, 255 Centre street, New York, manufacturers of many kinds of electrical novelties and dry batteries, have put on the market the watchman's lantern here illustrated. This device, owing to its absolute safety, so far as setting fire to any indammable material is concerned, is referred to as particularly suitable for watchmen, farmers, stablemen, firemen and especially in powder mills or where paper patterns are made, &c. It is fitted with a strong lens, which concentrates and directs the rays of the incandescent bulb. The construction is strong and durable, the material being brass, nickeled. The dimensions and capacity are as follows: Body, 4½ inches diameter,

Watchman's Electrical Lantern.

5 inches high; bail, 7 inches in diameter and ¼ inch thick. The reflector is 2½ inches in diameter. A lamp of 6 candle power is supplied with a 5½-volt current generated by five dry batteries carried in the body of the lantern. The candle power of the lamp is largely magnified by the powerful reflector surrounding it. The lantern can be conveniently carried on the arm, there being no oil or grease to soil clothing, thus leaving both hands free for use. With average usage the batteries are said to last about one month, when they can be renewed by lifting them out and substituting others. The light is turned on and off by a switch, seen at the top of the lantern cover.

Clark's Eagle Blind Hinge.*

The Clark Mfg. Company, Buffalo, N. Y., for whom Allerton-Clarke Company, 97 Chambers street, New York, are general agents, have just put on the market

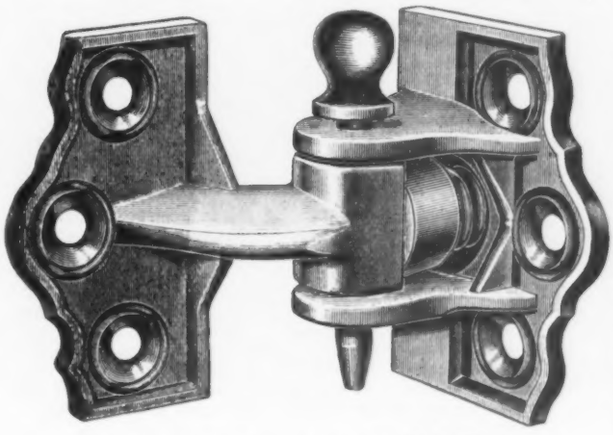


Fig. 1.—Clark's Reversible Eagle Blind Hinge.

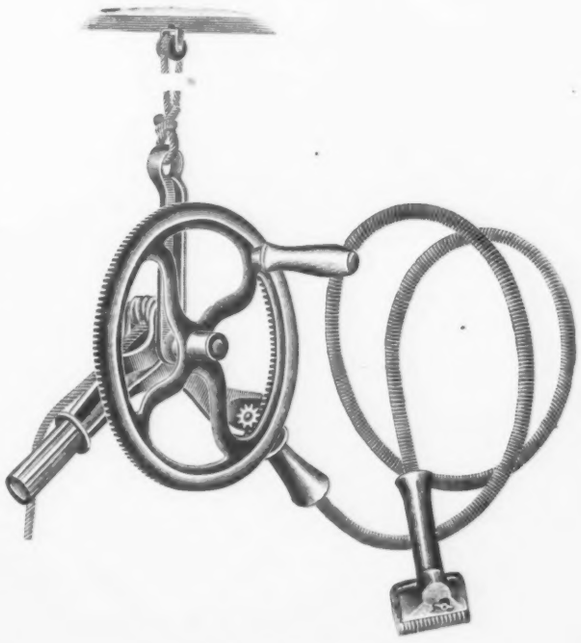
Clark's Eagle blind hinge, as illustrated in Fig. 1. It is reversible, suitable for either right or left hand, and is known as No. 75. This hinge requires no raising of the blind to unlock it. The hinge is actuated by a substantial coiled steel spring which presses against the end of the pin portion of the opposite wing. The blind is readily opened and locked on the same plane, and may be locked half open, as shown in the cut. An inside catch

Fig. 2.—Blind Fastener.

is not necessary to keep the blind closed, but for greater security they furnish with the hinge the fastening shown in Fig. 2.

The Twentieth Century Clipper.

The Chicago Flexible Shaft Company, 124 La Salle avenue, Chicago, Ill., are putting on the market their new Twentieth Century clipper, shown herewith. The 12-inch balance gear has teeth on its inner edge which



The Twentieth Century Clipper.

engage with a small hardened tool steel pinion, which in turn transmits the power to the flexible shaft and knives. The machine is supplied with the improved one nut tension knife, and all parts are interchangeable. The clipper is alluded to as free turning, fast cutting, simple, and as permitting the clipping of a horse in less than 30 minutes. The clipper weighs 15 pounds complete, and each one is packed separately in a box 14 x 14 x 2¾ inches in size, the weight boxed being 19 pounds. This makes a convenient package to carry in stock by the retail trade or to carry from place to place. It is pointed out that the clipper can be set up ready for use in one minute, that it requires no experience to operate it and that a small boy can turn the crank all day without tiring.

The Truss and Cable Wire Fence.

The Truss & Cable Fence Company, Youngstown, Ohio, are offering the trade the wire fence shown in Fig. 1. It is composed of six No. 13 galvanized spring steel wires and is made in 2 and 4 inch widths. Both sizes weigh about 2 pounds to the rod for each strand. A fence can be made of as many strands as desired, the

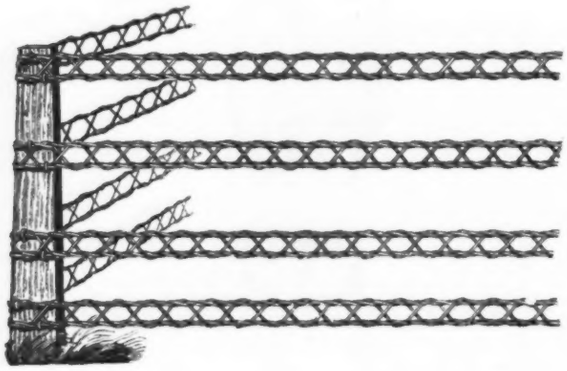


Fig. 1.—The Truss and Cable Wire Fence.

cost of the fence depending upon the number of strands used. The fencing is put up for shipping on small, compact reels, shown in Fig. 2, weighing about 100 pounds each, which are convenient to handle. By referring to Fig. 3 it will be seen that the fencing has no sharp twist

Fig. 2.—The Fencing on Compact Reels.

to the wire. The point is made that because of this feature none of the wires are strained or broken in construction and that it is not liable to break or rust out. Should any of the wires happen to rust or break it can be easily repaired by ripping off the strand between the

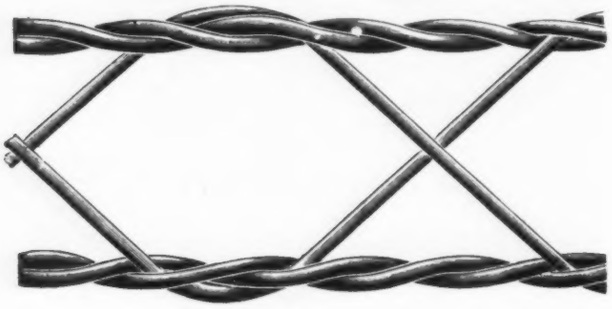


Fig. 3.—The Truss and Cable Fence Wire.

posts and replacing it with a new one with small cost and labor. It is claimed that expansion and contraction are taken care of automatically. The fence can be erected rapidly by unskilled laborers, it is explained, and is equally suited for rough country and level land.

Andre Hardware Company have just commenced operations in Connersville, Ind., handling Shelf Hardware, Tinware, &c.

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